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ABSTRACT

This document, as a supplement to the final report of the Orthopaedic Training Study, contains the documents considered to be important in providing the background for the study. The materials are organized into four major areas: initial correspondence, instrumentation, special reports, and psychomotor skills. See also HE 003 275 and HE 003 276. (HS)

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THE ORTHOPAEDIC TRAINING STUDY

FINAL REPORT SUPPLEMENT

PART A

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Center for Educational Development
University of Illinois at the Medical Center

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Public Health Service
Department of Health, Education and Welfare

HE003277

INTRODUCTION

This supplement contains the documents considered by the Staff to be important in "telling the story" of the Orthopaedic Training Study. In making these selections from the wealth of material, the Staff felt keenly the struggle between succinctness and their obligation to provide the story *in toto*. The result of this struggle is the material in these two volumes. Other documents, in the form of Study Books, provide a more extensive illustration of managing the Study and are available at the Center for Educational Development.

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INITIAL CORRESPONDENCE

I. Initial Correspondence

  A. Grant Application (Proposal)

  B. Letter introducing the Study

  C. Intensive Study Group

  D. Survey Group

  E. ABOS policy regarding Study

  F. Certification waiver

  G. General Study Outline

  H. Resident Brochure - Phase 2, A Description

Much of the Initial Correspondence is reproduced here since it indicates both the purposes and the direction of the Study. Particularly significant is the ABOS policy regarding the Study (I. E.), and the General Study Outline (I. G.).

RESEARCH PLAN

Introduction and Specific Aims

During the last twenty years the trend toward specialization in medicine has been accompanied by a steady extension of the training required for formal Board certification both in traditional specialties and the increasingly numerous subspecialties. Although it is generally agreed that this trend has improved the quality and variety of health services available to the community, there is growing concern about the time a potential practitioner is required to invest in this training, increasing question about the fixity of these requirements which appear to deny an opportunity for the expression of individual differences in learning speed and patterns, and skepticism about the educational efficiency of training programs as they are currently designed and operated.

It was such questions that led to discussions between the American Board of Orthopaedic Surgery and the Center for the Study of Medical Education which culminated in a research project entitled Efficient Use of Medical Manpower that was funded by the Bureau of State Services (CH). This study focused upon the definition and measurement of professional competence in orthopedics, with the aim of increasing the validity and reliability of such appraisals to such a point that the Board would be prepared to accept the measured accomplishment of a candidate, without regard for the time or content of his training, as the primary criterion for certification. The major findings of the study are summarized in a later section of this application. Acting on the basis of this research and the resultant evolution of evaluation procedures over the three year period of study, the Board concluded at a project review meeting on June 30, 1967, that sufficient progress had been made to justify experimental modification of time, sequence and content of training in a controlled study sample, from which study more general flexibility of training requirements might emerge.

The Skeletal System Committee of the National Research Council - National Academy of Science has also become concerned about the quality of residency training in orthopedics, and particularly over the apparent failure of such training to recruit young orthopedists to academic and research careers. An ad hoc subcommittee appointed to consider this question in detail commissioned an exploratory study which led to the conclusion that a major factor contributing to this situation is a dearth of imaginative, creative and well-qualified educational leadership in orthopedics. There is no evident shortage of highly skilled orthopedists among the program directors and it is possible to identify a substantial number interested in research, but there is little to suggest that these individuals are familiar with the vast body of knowledge derived from the growing field of educational science, or that they have incorporated into their training programs instructional practices which carry the highest probability of success and assure the most efficient use of personnel, time and resources.

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The interest of these influential representatives of the orthopedic community has contributed substantially to the creation of a climate which makes it not only possible, but desirable, to embark upon a detailed analysis of present training activities, and through such a mechanism to assist residency program directors to acquire such increased familiarity with contemporary educational theory and practice as would enable them to augment the efficiency and effectiveness of their efforts. On April 21, 1967, the NRC-NAS Skeletal System Committee also agreed to lend support to the development and implementation of such a study.

The related interests of the American Board of Orthopaedic Surgery, the Musculo-Skeletal Committee (NRC-NAS) and the Center for the Study of Medical Education are joined in this proposal to build upon and extend the current investigation in order to achieve the following broad objectives:

1. To provide a model of individualized graduate education in medicine in which the demonstration of individual competence, rather than the fulfillment of rigid time and content requirements, marks the end point of formal training.

2. To document the nature and variations of orthopedic training in the United States.

3. To devise and test methods for increasing the efficiency and effectiveness of orthopedic training.

4. To determine the relationships between input, training, and output variables.

5. To develop mechanisms that will facilitate continuing institutional self study of training programs.

6. To develop a pool of educational specialists in orthopedics who can provide continuing leadership in the field.

Methods of Procedure

The accomplishment of these goals within the proposed four year study period requires that several phases of the study be conducted simultaneously, but for clarity of presentation the elements will be described independently. A sequential schedule of activities is included in a subsequent section.

1. Introduction of Flexibility. Studies already completed have shown the wide range of achievement among residents in each year of training programs, and the substantial overlap of achievement among individuals in all four years. The evidence is persuasive that some might qualify for certification in a significantly shorter time than is now required even without modification of instructional content or methodology. In order to provide an early opportunity to demonstrate the validity of this hypothesis, approximately 15 training programs, to include 200-250 residents, will be selected for designation as experimental institutions. The criteria for selection will be developed jointly by an Advisory Committee representing the three

participating agencies. The cooperation of these program directors will then be enlisted to permit their residents, with the authorization of the American Board of Orthopaedic Surgery, to depart from the present time and content distribution requirements without jeopardizing their eligibility for Board certification. The participating residents will then be authorized to present an application for examination to the Board committee on eligibility when in the opinion of their program director they are prepared to take the Board examination. The successful candidates may then proceed immediately to fulfill the practice requirement (which is presently one year) and at the conclusion of this period may apply for final certification.

In order to maximize the opportunity for increasing the speed and efficacy of learning, program directors in these institutions will be provided with assistance in introducing a process of continuous performance monitoring and feedback to the resident in order that both staff and resident will be aware of the individual progress toward achievement of the critical components of competence in orthopedics (see appendix). The instruments to be used in this assessment will include the annual in-training examination given by the American Academy of Orthopaedic Surgery (developed with the assistance of professional staff from the Board), and a variety of check lists, rating scales, tests of complex cognitive and interpretive skills developed in the original study.

2. Intensive Study of Training Experiences. The critical components of competence in orthopedic surgery (see Appendix) define the educational goals toward which training programs should be directed. The purpose of this segment of the proposed study is to identify the extent to which 1) training programs provide opportunitites for resident to gain the defined knowledge, skills and attitudes; 2) the curricular organization, instructional materials and methods conform to generally accepted principles of learning; and 3) systematic evaluation is conducted and utilized for continuous program assessment.

A 20% stratified sample (to include the previously designated experimental institutions) of the 277 approved residency programs will be selected to represent variations in academic affiliation, hospital size, nature of population served and degree of program integration (some residencies are approved for full programs while others are approved for only one program segment either in affiliation with another institution that offers the remainder of the training or as a free standing part). A particular effort will be made to include in this sample a substantial segment of the programs supported by National Institutes of Arthritis and Metabolic Disease Training Grants which have a special educational mission. Each program will be analyzed to document:

1. Program organization - including schedule of resident rotation, the personnel who supervise training, the facilities and resources to support the training.

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2. Program objectives - the mechanism of their establishment, review and communication to staff and residents.
3. Program operation - activities and responsibilities of a resident sample, the nature of instructional procedures both formal and informal, the nature of feedback to residents of their individual strengths and weaknesses as training progresses..
4. Program evaluation - the mechanisms employed to accumulate data about resident progress, program effectiveness and the utilization of these data in continuing program review.
5. Program perceptions - identification of similarities and differences among residents and staff in the perception of purposes, procedures and effectiveness.

In addition to review of documents describing training programs and facilities, data collection for this phase of the study will employ both survey and observational techniques. Survey data will be collected by means of an objective questionnaire to program chiefs, recent graduates and residents in training, requesting descriptive information on the educational resources actually used in training; the nature and amount of instructional activity in which residents actually participate; the extent and character of resident responsibility for patient care, teaching and research; the amount and character of feedback on performance regularly provided to each resident from senior residents, attending staff and training chief. Observational data will be obtained from site visits by the orthopedists engaged in the special training program described in a later section of this proposal, and other project staff. In the course of a 2-3 day visit a random sample of instructional experiences (rounds, conferences, seminars, operative and emergency room teaching) will be described through carefully structured checklists and rating scales designed to document the quality of instructional exchange between trainees and their mentors, the educational goals (cognitive, psychomotor, affective) the exchange is more likely to serve, and the pedagogic quality of the encounter (in terms of the facilitation of learning, not the biomedical content).

Included in the analysis of training will be either a series of time and motion studies of a small sample of residents in several training settings, a larger sampling of the residents daily work through log-diary accounts, or a combination of these. The final decision on methodology must await preliminary feasibility studies.

3. Experimental Modifications of Training. It is anticipated that such intensive review will quickly identify areas in which new organization of training systems, or utilization of alternative instructional modes would predictably increase either efficiency or effectiveness of training. In the experimental institutions this would lead to introduction of such innovative devices as simulations to facilitate the refinement of problem solving skills, doctor-patient

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interactions or communication skills; programmed instructional methods for more rapid acquisition of visual discriminatory skill (as in x-ray interpretation); or self-evaluation procedures to augment the ability to recognize personal limitations and to stimulate self-reliance. As such procedures are introduced their effectiveness will be measured against more familiar methods in use. Based on pilot studies in single institutions a determination will be made about the desirability of incorporating such instructional and program modifications in the entire experimental group (using other institutions for control) or in selected experimental institutions (using the remainder for control).

However, numerous studies at other educational levels have failed to establish any uniform relations between variations in specific instructional methodologies or instructional aids and variations in achievement. These studies suggest that the more critical determinants of achievement are those associated with more pervasive factors influencing the climate for learning (Hatch, et. al.) such as the availability of a variety of methodologies and aids from which each individual can select those most useful to him, the sequential development and integration of experience, the nature of the interaction between trainee and mentor, the amount and character of the responsibility assigned the former for his own learning and the amount and quality of the feedback on his own performance that the system affords him. To test the hypothesis that changes in these more subtle characteristics of the training experience will have significant effects on achievement patterns, certain of the experimental programs will be selected for more fundamental modifications in orientation and nature of staff-trainee interaction.

As changes both in specific methodology and in the general climate for learning are introduced their effect upon resident achievement will be assessed through the cross sectional and longitudinal studies that are described in the next section.

4. Relationship of input, training and output variables. The studies initiated with the American Board of Orthopaedic Surgery in 1964 have produced a resident identification system that allows the investigator to maintain a running, computerized record of individual resident progress as it is assessed through annual in-training examinations offered to all candidates in all years of training; standardized supervisor ratings of individual resident achievement of knowledge, problem solving and interpretive skills, and a series of attitudinal characteristics; the Board certifying examination which probes complex cognitive processes, professional behavior, and selected technical skills. In addition it is now possible to incorporate data derived from Medical College Admissions Tests, and negotiations are under way to include National Board scores (Part I, II, and III) in the data pool.

Cross sectional data will be assembled during each year of the study on the population noted in Table I. From the data bank it will then be possible to extract those elements dealing with the particular

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TABLE I

N	Population	Nature of Sample
1500	Residents in conventional training programs	Essentially 100%
400	Board Candidates	Essentially 100%
200 - 250	Residents in experimental programs	Essentially 100%

component of professional competence then under study. Standard methods of multivariate analysis will be utilized to identify the input and training variables associated with different patterns of competence.

Longitudinal investigations will be undertaken to determine the rate of gain, retention or loss over time of critical components of competence in groups of trainees exposed to differing training programs. In addition to the annual retesting of trainees, a ten year follow up (ten years having been selected on the basis of studies suggesting that physicians reach the peak of their professional competence roughly 5-10 years following completion of training) will be projected. Standard method of correlational and multivariate analysis will be employed to determine the relationship between changes in the performance of these groups over time and relevant demographic, career and training variables such as the nature of the educational background, the experience, the present practice setting etc.

5. Development of self-study mechanisms. In order that this study might become more than an interesting collection of data, the findings will be incorporated in periodic reports to training program directors. Such reports will be accompanied by suggestions of mechanisms by which the data provided through in-training examinations can be incorporated into continuous program assessment; the provision of simple instruments by which data on program operation, effectiveness of instructional methods and resident progress may be gathered for periodic review; and recommendations of means by which such information might most effectively be shared by training staff and trainees in the interest of improved programs.

During the last year of the study a series of regional conferences designed as an intensive introduction to educational science will be offered to training program directors. Data derived from the study will be used as a point of departure in developing principles of curriculum planning, and of selection and use of instructional methods and evaluation procedures.

Finally a comprehensive study report will be planned for the entire orthopedic profession at the annual meeting of the American Academy of Orthopaedic Surgery and through journal publication.

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5. Development of a Pool of Educational Specialists in Orthopedics. In order to create a cadre of skilled educational leaders in orthopedics who can serve as staff in the study and as a permanent resource for the profession, a specific training component has been built into this program. Efforts have already been initiated, and with gratifying results, to recruit four young orthopedic surgeons who have developed a special interest in an educational research and development career, to embark upon a graduate program leading to a Master of Education (in medicine) degree. This program, which is already established and operating through the Center for the Study of Medical Education, requires the candidate to engage in specified course work given both in Urbana and on the Medical Center campus by CSME staff members who also hold appointments in the College of Education. It also requires the completion of a thesis based upon an original study in the general field of medical education. It is expected that these candidates will each use some segment of the study of orthopedic training, carried out jointly with project staff members, to fulfill this thesis requirement. During the second year they will serve directly as study staff members and at its conclusion will be uniquely prepared to further guide and implement studies and program improvements in orthopedics initiated during this cooperative study.

Trainees will be selected by the Advisory Committee after consultation with other responsible representatives of the involved agencies. During the first year of training they will be supported through other sources; during the second year when they will serve full-time as study staff members, stipends will be derived from the research budget. Two trainees will be appointed the first year, and one in each of the next two years.

Proposed Study Timetable

June 1968 - May 1969

1. Begin Training Program for two orthopedists.
2. Staff and Trainees develop detailed study program including identification of experimental institutions and sampling procedure, for decision with Advisory Committee.
3. Disseminate general description of study plan to Training Program chiefs and establish tentative timetable for institutional visits.
4. Complete development of study instruments (check lists, rating scales, questionnaires, inventories etc.) Pilot test new instruments.
5. Initiate development of program self-study manual and materials
6. Initiate pilot studies of new instructional methods.
7. Semi-annual meeting with Advisory Committee.
8. Initiate special testing in experimental institutions. Continue data gathering from in-training & certifying exams.

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June 1969 - May 1970

1. Third and fourth trainees to begin program on June 1, 1969 and June 1, 1970.
2. Carry out training program site visits.
3. Complete data collection from questionnaire and inventory administered to program directors, recent graduates and residents in training.
4. Institute experimental instructional activities in selected programs.
5. Retest residents in control and experimental programs on selected outcomes, and continue general data gathering on all residents and candidates.
6. Semi-annual meetings with Advisory Committee.

June 1971 - May 1972

1. Complete experimental instruction.
2. Complete data collection regarding nature and outcome of experimental programs.
3. Assemble, analyze and interpret data. Prepare final report.
4. Present findings and recommendations at January 1972 Annual Meeting of the American Academy of Orthopaedic Surgeons.
5. Regional meetings for training program directors to consider program implications of data, the means of exploiting educational theory and technology, the use of program self-study materials.
6. Prepare plans for 10 year follow-up.

Significance of this Research

In a complex, highly integrated industrial society, operating at essentially full employment there are essentially only four major patterns of approach possible to the solution of critical shortages of specialized manpower:

1. Expanding the pool of qualified personnel by attracting additional numbers into the specialty.

2. Improving the quality (i.e. productivity) of practitioners.

3. Extending the productive life of practitioners.

4. Reorganizing the delivery of services in such a way as to permit persons with less scarce skills to discharge some of the responsibilities presently assumed by individuals in short supply.

All of the last three approaches are incorporated to differing degrees in the proposed study. With the emphasis on identifying the variables that influence program effectiveness and experimental manipulation of these variables it is reasonable to expect some increase in the productivity of practitioners. Further, evidence from the critical incident research (see below) in the present study strongly suggests that some inefficiencies in the utilization of specialized health manpower are a consequence of the disease orientation of, and the crisis medicine practiced by, clinicians in this field, and that these inefficiencies are exacerbated by the physician's ineptitude in establishing effective working relationships with other health professionals. With the emphasis in the proposed study on identifying specific patterns of competence and on re-designing programs to meet these needs it is reasonable to expect some improvement in the organization of health services and some more effective delegation of responsibilitites for delivering them in the practice of orthopedics.

However it is to the third approach--extending the productive life of practitioners--that the present study is most directly addressed. The pattern of change in medical education over the last four decades has been a steady extension of training requirements for the growing number of physicians who have elected to practice as specialists rather than as generalists. In 1927 the medical school course of study was four years in length; it remains so in 1967. But forty years ago most physicians entered practice after one year of internship; today a majority extend this training through residencies of 2-5 years in length. While the rigidity and temporal uniformity of undergraduate programs of medical education is difficult to defend, it is at least subject to the checks and balances which collegial life imposes. The nature of residency training, on the other hand, is determined by special interest groups operating independently, and outside the influence or scrutiny of other disciplines.

The American Board of Orthopaedic Surgery has taken the position that the certifying procedures and educational requirements for which it is responsible should be subjected to the same dispassionate and critical study as the musculoskeletal diseases in which they are chiefly interested. It was this philosophic stance that led to initiation of the studies now being carried out jointly by the Board and the Center for the Study of Medical Education. The data have demonstrated that the fixed training time and distributional requirements may not be necessary for all residents, and the Board is now prepared to explore the next step, embodied in this proposal, of relaxing such requirements for an experimental group of programs, and the introduction of instructional innovations that may further enchance training effectiveness. If this effort demonstrates that shortening the training experience, or modifying it in other ways in order to facilitate individual achievement of presently required professional competence or new dimensions of competence, is feasible and does not compromise quality, they are prepared to consider the extension of this relaxation to all training programs.

While such a posture will be important to the extension of productive years of future orthopedists, it is even more important as

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a dramatic demonstration to the rest of the medical community that assessment of competence, rather than fulfillment of fixed and specified time and content training requirements, can be utilized as the primary criterion for certification. It is the impact that this demonstration may have upon the rest of graduate (and even undergraduate) medical education that represents the most significant aspect of this study. Each year approximately 7500 new physicians enter the system of graduate training. If increased efficiency of the educational process could reduce their training period by as much as one year, 7500 man years would be added annually to the professional manpower pool in medicine - a not insignificant increment.

It is unlikely that such a goal will be achieved without dynamic and informed educational leadership. In fact, in earlier deliberations the NRC-NAS Skeletal System Committee noted that the shortage of qualified orthopedists seeking academic careers is among the most distressing of the manpower problems the specialty faces. An *ad hoc* committee appointed to consider this question in detail commissioned an exploratory study which led to the conclusion that a major factor contributing to this situation is a dearth of imaginative, creative and well qualified educational leadership in orthopedics. The proposal set forth here addresses this issue directly by attempting through the study mechanism to increase the pool of orthopedists trained in educational sciences, or more familiar with the operational utility of the educational disciplines, with the expectation that such additional resources will facilitate development of more challenging, and more effective, educational experiences for trainees. But again it is the demonstration of the feasibility, and the usefulness, of such a development for other specialty groups that will be of the greatest general significance.

Facilities Available. The Office of Research in Medical Education was established at the University of Illinois College of Medicine in 1959 as an intramural agency to study the educational problems and opportunities facing the College and to make recommendations for their solution. In the ensuing eight years it has evolved into a major Center for the Study of Medical Education, with educational research and development interests that go beyond a single institution. The Center is organized in four functional units: Curriculum Studies, Evaluation Studies, Instructional Systems Development, and Training. A Systems Analysis and Statistical Services Unit provides research design and data analysis support for all sections and coordinates data processing through the Medical Center Research Resources Facility computer service or other required computer facilities. The original full time professional staff of a physician-educator and an educational specialist has now been augmented by two physicians, three evaluation specialists, two educational psychologists, an instructional systems specialist, part-time associates in educational sociology, computer programming, instructional television, and supporting clerical and technical assistants.

The staff and six Fellows in Medical Education are housed in the Medical College complex in permanent quarters which include offices, conference rooms, work rooms, library and learning laboratory. Additional temporary space has also been provided for staff working on short term projects. These quarters are sufficient for the staff proposed for this study.

The major items of fixed office equipment required for this study are already available.

Collaboration. Each of the participating agencies has already named a principal collaborator. Dr. Paul Lipscomb will represent the American Board of Orthopaedic Surgery and Dr. Fred Reynolds will represent the National Research Council-National Academy of Sciences Skeletal Systems Committee. A curriculum vitae for each of these men is attached. One additional representative of each agency will be appointed to serve on the Advisory group. The collaboration of training program directors cannot be assured until these programs are selected and their participation sought. Since the two collaborating agencies include in their membership the major leaders of the United States orthopedic community who are eager to carry out this study, the cooperation of their colleagues is virtually assured.

Supporting Data

A summary of the work carried out during the first three years of the original grant has been forwarded under separate cover. A final full report of the study methods and findings will be submitted at the end of the current project period (May 31, 1968).

College of Medicine
UNIVERSITY OF ILLINOIS AT THE MEDICAL CENTER, CHICAGO

Office of Research in Medical Education
Center for the Study of Medical Education
901 S. Wolcott Avenue · Chicago, Illinois 60612 · Telephone 663-3590 (Area Code 312)

August 5, 1968

Dear Dr.

On behalf of the Orthopedic Training Study Advisory Committee, which includes designated representatives of the American Board of Orthopaedic Surgery, the NAS-NRC Skeletal Sysatem Committee, the American Academy of Orthopaedic Surgeons, and the Center for the Study of Medical Education, I write to Invite your participation in Phase II of the study.

As you know, Phase I was devoted to systematic delineation of the critical components of competence in orthopaedics, an analysis of the means by which that competence was judged, and the refinement of tools by which increasingly reliable and valid judgments might be made. Phase II will move from this indirect study of training to direct documentation of its organization and implementation in a carefully selected sample of institutional settings, and will test new methods and materials designed to increase training efficiency or effectiveness in a group of experimental programs.

As a matter of interest, I have attached a list of institutions which have agreed to engage in the experimental aspects of training. I hope you will be willing to have your program included in the larger sample of institutions in which training will be studied somewhat less intesively, as described in the attached excerpt from the research grant application.

In closing, let me assure you that this study is not related to the accreditation process. It is designed to gather information that should be helpful to individual programs as well as providing data of more general interest to those responsible for graduate education in medicine.

If further information is required, please have no hesitation in requesting it. I will look forward to your response.

Sincerely yours,

George E. Miller, M.D.
Director

UNIVERSITY
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Enclosure

Orthopaedic Training Study

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Survey Group

Medical College of Alabama

Albany Hospital

Allegheny General Hospital

Baroness Erlanger Hospital

Baylor University
College of Medicine

Duke University Hospital

Georgetown University

Howard University

Johns Hopkins Hospital

Los Angeles County Hospital

Marquette University
School of Medicine

Massachusetts General Hospital

Northwestern University

Presbyterian University Hospital

St. Francis Hospital

St. Louis University

Temple University Hospital

Tulane University
School of Medicine

University of Arkansas
Medical Center

University of Colorado

University of Louisville
School of Medicine

University of Michigan
    University Hospital

University of Minnesota Hospital

University of Oklahoma
    Medical Center

University of Oregon
    Medical School Hospital

Hospital of the University
    of Pennsylvania

University of Wisconsin
    University Hospitals

Vanderbilt University Hospital

Wayne State University
    College of Medicine

West Suburban Hospital

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January 13, 1969

For the guidance of program directors in the institutions designated as experimental programs for the 1968-72 period of the Orthopaedic Training Study, the American Board of Orthopaedic Surgery is circulating this statement of policy.

1. During this period, the present restrictions on program organization will be waived.

2. Residents in such programs may apply for admission to the certifying examination when in the view of the program director they have achieved a degree of competence sufficient for the independent practice of orthopaedic surgery.

3. Residents participating in these programs will be asked to sign a waiver releasing the Board from any liability should they be proposed for early examination or not proposed for this acceleration.

4. Residents who are admitted to early examination and successfully complete that examination may enter practice without further training. Those who are unsuccessful must then complete a prescribed training program to fulfill minimum requirements as set forth in the current rules and procedures.

5. Successful candidates will upon completion of the practice requirement apply to the Board for final certification.

6. The cost of early examination will be borne by the Board (through the research grant). After meeting the practice requirement, the candidate will pay the regular fee for final certification.

Paul R. Lipscomb, M.D., Secretary

College of Medicine
UNIVERSITY OF ILLINOIS AT THE MEDICAL CENTER, CHICAGO

Office of Research in Medical Education
Center for the Study of Medical Education
901 S. Wolcott Avenue · Chicago, Illinois 60612 · Telephone 663-3590 (Area Code 31

Sample Letter, Package I

Dear Dr. ____________:

As you are no doubt aware, Phase I of the Orthopaedic Training Study has been successfully completed and the planning and implementation of Phase II is well under way. Phase II is to be devoted to: 1) the collection of systematic, descriptive data about the nature and variation in orthopaedic training programs; 2) experimental modification of the educational programs in selected institutions; and 3) a study of the relationship between input, training and output variables.

Since one of the major outcomes of this Study will be the opportunity for you, as program chief, to identify men as candidates for certification when you feel that they have reached a level of adequate competence, it becomes important to define the position of the American Board of Orthopaedic Surgery on that point. A Statement of Board policy relating to waiver of requirements is enclosed.

Additionally, for the protection of the individual and of the American Board of Orthopaedic Surgery, it is necessary for each resident in training to acknowledge the position and policy of the Board by signing a statement to this effect, a copy of which has been enclosed for your information.

It is our plan to forward to you next packages for distribution to to your resident which will contain a descriptive letter concerning the Statement of Accord, the statement itself, and a brochure describing the Orthopaedic Training Study. A copy of this brochure has been enclosed for your information.

Once these necessary preliminaries have been completed, the implementation of the Study can begin.

Sincerely,

Charles E. Gregory, M.D.

encs.

UNIVERSITY
OF ILLINOIS
CENTENNIAL
YEAR 1967-68

STATEMENT OF ACCORD

I understand that the American Board of Orthopaedic Surgery, the NRC-NAS Skeletal System Committe, the Center for the Study of Medical Education are involved in a collaborative investigation of the education of orthpaedic surgeons in the United States of America, for the purpose of increasing the efficiency and effectiveness of that education and the process by which certification of competence is established.

I further understand that, as a part of that investigation, the American Board of Orthopaedic Surgery may waive or change its usual requirements for certification for certain orthopaedic surgery residents participating in the investigation, at the discretion of the Board.

I further understand and agree that the information gathered from the material used in the investigation, including scores on the Orthopaedic In-Training Examination and the Orthopaedic Certification Examination, and including the various questionnaires involved, may be utilized for statistical and research purposes, and that all data pertaining to private individuals are to be considered confidential.

I further understand that the currently existing requirements for certification as specified by the Board will continue to apply to all residents who are not subject to the waiver.

____
(Signature)

____
(Date)

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Sample Letter, Package II

To: Resident

Dear Doctor:

The American Board of Orthopaedic Surgery, in cooperation with the NRC-NAS Skeletal System Committee and the Center for the Study of Medical Education, has embarked on an extensive study of orthopaedic residency training in the United States.

The purpose of this study is to effect improvements in the quality of training, and the concepts involved in the approach being taken has been outlined in the brochure you will find enclosed. We ask that you familiarize yourself with its content.

In order to protect your rights and those of the American Board of Orthopaedic Surgery we further ask that you carefully read the enclosed Statement of Accord, sign it if you agree with its content, and return it to your chief.

Additional material and activities will be forthcoming shortly, and we earnestly request your cooperation in order to make the effort a meaningful success.

Thank you.

Sincerely,

Charles Gregory, M.D.

Enc.

College of Medicine
UNIVERSITY OF ILLINOIS AT THE MEDICAL CENTER, CHICAGO

Office of Research in Medical Education
enter for the Study of Medical Education
901 S. Wolcott Avenue · Chicago, Illinois 60612 · Telephone 663-5530 (Area Code 312)

Sample Letter, Package II

To: Chief of Program

Dear Doctor ____________:

As indicated previously, we have now forwarded to you a set of packages for distribution to your residents.

Each package contains the descriptive brochure covering the Orthopaedic Training Study, a copy of which was sent to you earlier.

In addition, each contains the Statement of Accord and a letter explaining its necessity. We ask that each resident return his signed copy to you, and that you forward these to the American Board of Orthopaedic Surgery in the envelope provided.

Thank you for your cooperation.

Sincerely,

Charles Gregory, M.D.

UNIVERSITY
OF ILLINOIS
CENTENNIAL
YEAR 1967-68

ORTHOPAEDIC TRAINING STUDY

General Outline

1968-69

This year will be devoted chiefly to accumulation of data about present program operations.

- assembly of printed material
- preliminary site visits
- preliminary questionnaires to program staff and resident staff
- continued accumulation of information from in-training and certifying examination

During this period special study instruments for more detailed analysis of program activities will be developed.

Preliminary data will also be used to identify areas in which introduction of alternate learning modes or evaluation methods might be helpful in facilitating acquisition of specific kinds of professional competence.

No specific effort will be directed toward accelerating training, but program directors may wish to identify residents whose eligibility for early admission to the certifying examination should be requested.

1969-70

More detailed study of training

- site visits
- questionnaires and inventories to program directors, residents in training and recent graduates

Institute experimental variations in training patterns in selected institutions (by arrangement)

- alternative curricular patterns
- specific instructional aids
- self-study and self-evaluation devices
- specific training for teachers

Continue accumulation of achievement information from in-training and certifying examinations.

1970-71

Extend introduction of experimental training activities found useful.

Introduce additional variations in selected institutions.

Provide summary data and further guidance to program directors.

1971-72

Extend introduction of experimental training activities.

Follow-up site visits.

Regional meetings for program-directors to report findings, and to elicit recommendations.

GEM:mac

September 24, 1968

ORTHOPAEDIC TRAINING STUDY

Phase 2
A Description

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

prepared by

Center for the Study of Medical Education
University of Illinois

April, 1969

Introduction

The information presented here is designed to acquaint residents and staff with the background and purposes of the present Orthopaedic Training Study.

This Study has been undertaken by the American Board of Orthopaedic Surgery, the NRC-NAS Skeletal System Committee and the Center for the Study of Medical Education, University of Illinois, with the cooperation of the American Academy of Orthopaedic Surgeons and the assistance of your chief.

You are an important part of the Study since only you can provide some of the essential information about yourself and your program required during the next four years. We hope that this brief overview will aid you in understanding the nature of the Study and its potential impact on orthopaedics.

THE FIRST PHASE

Those of you who have taken the Orthopaedic In-Training Examination are aware of the major changes that have occurred during the last few years both in those examinations and in the certification examinations. These new developments are the result of a continuing effort of the American Board of Orthopaedic Surgery to improve training and certifying procedures. They are a consequence of the Orthopaedic Training Study undertaken jointly in 1964 by the Center for the Study of Medical Education and representatives of the national orthopaedic community. Phase I of that Study was designed specifically to create new examining techniques and to improve older ones as a means of assessing competence in orthopaedic surgery.

Once these methods had been developed, and their validity and reliability established, it was possible to begin planning a second phase which would investigate the factors that seem to be related to orthopaedic competence as measured, in part, by these examinations. Such an investigation would provide the vehicle for developing and improving training methods and techniques.

THE SECOND PHASE

We are all aware that orthopaedic residents participate in a wide variety of experiences and activities during training, and that these differ from institution to institution. It is known, for example, that the nature of available clinical problems and the character of resident responsibility varies widely from program to program. These variations may be related, in some way, to the outcomes of orthopaedic training. If this is true, and if the examinations presently given measure these outcomes adequately, it is possible by systematic study to identify those methods and conditions that contribute most to the effectiveness and efficiency with which the desired outcomes are achieved. Once such methods and conditions are identified it will be possible to introduce them under controlled conditions into selected programs in order to determine more precisely their effects.

In order to do this, the Advisory Committee (which includes representatives of all the previously noted collaborating groups) has selected 16 representative training programs to serve as experimental institutions during the Study, and an additional 38 programs for less intensive study to augment the research sample.

You can provide valuable assistance to this Study by: 1) cooperating with your training chief to make this Study possible; 2) completing the various questionnaires which will be sent to you from time to time; and 3) cooperating with the research team when they visit your program to gather on-site information.

You can be assured that the information you provide will be treated confidentially, and that no information about an individual resident, program or attending will be available to anyone not part of the Study group. If you do not choose to answer a given question, you have the option of omitting that response. Finally, this Study is in NO way related to the process of program accreditation or of individual certification (except where special pacing opportunities are provided). Your co-operation will in no way jeopardize your opportunities for certification.

The following pages are designed to answer some of the questions you may have about the Study.

QUESTIONS ABOUT THE ORTHOPAEDIC TRAINING STUDY

WHO IS CONDUCTING THE STUDY? The Advisory Committee composed of representatives designated by the American Board of Orthopaedic Surgery, the NRC-NAS Skeletal System Committee, the American Academy of Orthopaedic Surgeons and the Center for the Study of Medical Education, University of Illinois.

WHY IS THE STUDY BEING CONDUCTED? For four reasons: 1) to document the nature and variation of training programs in orthopaedics; 2) to determine the effect of these variations on demonstrated measures of competence; 3) to introduce important innovations into selected programs; and 4) to assess the effects of these innovations on the efficiency and effectiveness with which orthopaedists are trained.

HOW WILL THIS STUDY AFFECT TRAINING? The Study staff is committed to help training programs provide orthopaedic residents with the best possible instruction so that residents will learn as much as possible, as efficiently as possible. Some residents will have the opportunity to participate in these new methods and innovations on an experimental basis. However, this participation will not prejudice their opportunities for, or progress in, the orthopaedic certification process.

WHAT CAN I DO? You are a most important part of this Study, since you will be providing detailed information about yourself, your program, and your attitudes during the course of the Study. Various documents asking for information will be submitted to you from time to time. Your response should not interfere with your regular responsibilities in your training program.

IS THIS STUDY REALLY IMPORTANT? Most emphatically YES. The activities and plans for this Study are designed to serve as a model for graduate medical education, and will directly influence the nature and content of orthopaedic residency programs and other specialty programs now and in the future.

WHERE CAN I GET FURTHER INFORMATION? By inquiring directly of your chief or by requesting that he obtain whatever specific information you require.

References

Miller, George, "The Orthopaedic Training Study", The Journal of the American Medical Association, Oct. 14, 1968, Vol. 206, pp. 601-606.

Miller, George, Christine McGuire, and Carroll B. Larson, "The Orthopaedic Training Study--A Progress Report", The Bulletin of the American Academy of Orthopaedic Surgeons, Vol. 13, Number 3, Dec., 1965, pp. 8-11.

INSTRUMENTATION

II. Instrumentation

- A. Site Visit Outline
- B. Sample accompanying letter
- C. List of variables and source of data
- D. Summary of instruments and returns
    1. Resident Procedures Form
    2. Institutional Description Form
    3. Resident Attitude Survey
    4. Attending Attitude Survey
    5. Resident Evaluation of Operative Procedures
    6. Program Questionnaire
    7. Resident Time Log
    8. Resident Evaluation Form
    9. Abbreviated Residency Board Candidate Survey
    10. Resident Background Form

The Site Visit Outline (II.A.) was designed to facilitate uniform gathering of validating data for other Study instruments. The sample letter (II.B.) is representative of the correspondence which accompanied each instrument.

Also noteworthy is the Summary (II.C.) listing the purposes of, and return rate for, each instrument.

Orthopaedic Site Visit Outline

A. The Purposes of the Visits Are:
   1. To validate the following self-report forms:
      a. Resident Attitude Survey
      b. Operative Procedures Form
      c. Attending Attitude Survey (under development)
      d. Q-Sort of program objectives
   2. To generate more involvement on the part of the residents and attendings in the study.
   3. To discuss and describe the most feasible innovations for a given program.
   4. To observe educational processes in various settings (rounds, seminars, etc.) and attempt to quantify them.
   5. To develop rapport with the chief, attendings and residents through both formal and by informal meetings and activities.

B. Guiding Principles
   1. Validation of self-report forms can be accomplished through judicious use of questions similar to those appearing later in this outline.
   2. It should be made clear to everyone that we do not possess answers as to the "best" educational techniques, program rotations, etc., to employ. We are seeking answers just as staff members are.
   3. All information and reports from programs are to be considered confidential. Feedback regarding some components (not individuals) will be provided at the fall meeting.
   4. It is probably best to plan to spend part of the time with specific residents and part of the time at specific facilities (clinics, etc.) rather than confining yourself to one mode of observation.
   5. Any discussion of other programs except in a very general way should be discouraged.
   6. We are attempting to view the program as a part of it rather than apart from it. Therefore, every attempt should be made to be as non-disruptive to the program as possible.
   7. Familiarity with the program is imperative. Please read the initial site visit reports before visiting the program.

C. Visit Schedule
   1. The tentative schedule of visits is attached; these dates may be changed if they are inconvenient for the program.
   2. Each program has been asked to suggest housing arrangements where required; these will be forthcoming.
   3. Transportation has been arranged for some visits. Please see that travel includes arrival at the program the evening prior to the scheduled visit.

D. Areas of Emphasis During Visits
   1. The programs have been asked to provide an opportunity for each visitor to observe:
      a. rounds
      b. operating room
      c. emergency room
      d. outpatient clinic(s)
      e. formally scheduled activities (conferences, seminars, etc.)

Other activities, when judged to be significant by the visitor, may be observed if agreeable to the program.

2. The following questions are only suggestions; you need not use them verbatim. However, we do need answers to these for validation purposes:

Attending Staff:

1. What kind of orthopaedists (research, community, academician) do you produce?
2. What mechanisms have been established to protect attendings and residents from over-service demands?
3. What feedback are residents given regarding their skills, attitudes, and abilities?
4. How is feedback given?
5. How is responsibility delegated?
6. What is the progression of responsibility (if any)?
7. How do you know a man is "ready" to assume more responsibility? And for what?
8. What innovations would be most practical and/or worthwhile for this program?

For Residents:

1. What feedback are residents given regarding their skills, attitudes, and abilities?
2. How is feedback given?
3. How much "elective" time do you have, how do you use it? (both in terms of program and daily elective time)
4. What is your "typical" day like?
5. How heavy is the service demand on this rotation?
6. How heavy has the service demand been in your total program thus far?
7. How do attendings relate to residents?
8. What, if any, kind of orientation did you recieve when you entered this program?

9. How much research is required? What kind?

10. Do you know what kind of orthopaedist you intend to be (research, community, academic)? Do you think this program is efficient in helping you achieve this goal? Do you think this program is effective in helping you achieve this goal?

11. Why did you select this particular residency program?

12. Why did you select orthopaedics?

13. In what way (s) do you think this particular program might be made more effective and/or effecient?

E. Reports:
   1. All observers are to complete a report covering:
      a. the general responses to these question with notable exceptions
      b. additional information and impressions believed by the observer to be significant
      c. suggestions or recommendations for further observations in the program
   2. Expense accounts as required.

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May 1, 1969

[redacted]

Dear Dr. Murray:

The first major step in the implementation of the second phase of the Orthopaedic Training Study being conducted by the American Board of Orthopaedic Surgery, the NRC-NAS Skeletal System Committee, and the Center for the Study of Medical Education, is the systematic gathering of data which define the variables in orthopaedic residency programs. The most efficient and comprehensive approach to this task is the utilization of the survey questionnaire technique.

The Program Questionnaire which is enclosed is the instrument designed to elicit the definition of which variables are operative in any given program. A request for completion of this instrument will be made of the chief of every accredited orthopaedic residency program in the United States. This, ideally, will provide a total sample and will therefore be of great value.

This particular questionnaire will be circulated only once to each program. A separate questionnaire will be circulated to a number of the institutions which are parts of certain programs, and this, too, will be circulated only once.

While it is recognized that the questionnaire is lengthy and will require an expenditure of time, we earnestly solicit your full cooperation in the knowledge that the results of the Study will be of significance to every member of the national orthopaedic community.

Thank you for your participation in this venture.

Sincerely,

George E. Miller, M.D.

GEM:mlm
Enclosure

I. Residents: Input Measures

A. Background

	Resident Background	Resident Attitude	Resident Procedures	Res. Eval. Oper. Proc.	Resident Time Log	Attending Attitude	Program Questionnaire	Institutional Descrip	Res. Evaluation Form	Academy Background	Site Visit	Remarks
1. Demographic Background												
a. age	x											
b. sex	x											
c. marital status	x											
d. number of children	x											
e. socio-economic status - parents												
1) income	x											
2) education level	x											
3) employment type	x											
4) economic change	x											
f. military or other government service	x									x		
g. geographical location of home	x									x		
h. illness or accident history	x											
i. race and ethnic origin	x											
j. prior practice												
1) type	x									x		
2) location	x									x		
3) length of time	x									x		
k. professional memberships	x											
l. present living arrangements	x											
2. Academic Background												
a. medical school	x											
1) name - location	x											
2) size	x											
3) when attended	x											
4) graduation rank (% level)	x											
5) grade point average	x											
6) MCAT Estimate	x											

Residents: Input Measures (cont'd)

	Resident Background	Res. Attitude	Res. Procedures	Res. Eval. Oper. Pro	Resident Time Log	Attending Attitude	Program Question.	Instit. Descrip.	Res. Eval. Form	Academy Background	Site Visit	Remarks
2. Academic Background (cont'd)												
7) National Boards												
Part I	x											
Part II	x											
Part III	x											
8) Internship												
a) where	x									x		
b) type	x									x		
c) when	x									x		
3. Attitudes												
a. perceived reasons for becoming a physician	x										x	
b. perceived reasons for becoming an orthopaedist	x										x	
c. perceived reasons for selecting program	x										x	
d. attitude toward role of orthopaedist as												
1) teacher	x	x									x	
2) researcher	x	x									x	
3) clinician	x	x									x	
4) administrator	x	x									x	
e. attitudes toward patients	x	x									x	
f. attitudes toward their role as residents	x	x									x	
g. order of program choice	x										x	
h. goal orientation												
1) type of practice desired	x									x	x	
2) location of practice	x										x	
i. anxieties and stresses												
1) ability related to other residents	x	x									x	
2) ability related to the task of orthopaedist	x										x	
3) rate of progress	x										x	
4) financial burden	x										x	
j. perception of program objectives	x	x									x	
k. degree of satisfaction with:												
1) learning climate and related activities	x	x										

Residents: Input Measures (cont'd)

	Resident Background	Resident Attitude	Resident Procedures	Res. Eval. Obser. Proc.	Resident Time Log	Attending Attitude	Program Questionnaire	Institutional Descrip.	Res. Evaluation Form	Academy Background	Site Visit	OITE	Remarks
k. degree of satisfaction with: (cont'd) 2) administration	x	x									x		
3) living arrangements	x										x		
4) salary	x	x									x		
5) responsibility	x										x		
6) school service, etc.	x	x									x		
7) attending men	x	x									x		
8) paramedical personnel	x	x									x		
9) program arrangement	x	x									x		
10) services	x	x									x		
B. Tested Pre-residency Abilities													
	x												
	x												
1) knowledge of science												x	1st Year OITE
2) knowledge of medicine												x	
3) ability to use medical information to solve medical problems											x	x	First Year OITE
4) ability at patient interviewing											x	x	" " "
											x	x	
5) knowledge of orthopaedics											x	x	First Year OITE
6) ability to use orthopaedic knowledge to solve problems.												x	First Year OITE

II.
Setting

	Resident Background	Resident Attitude	Resident Procedures	Res. Eval. Oper. Proc.	Resident Time Log	Attending Attitude	Program Questionnaire	Institutional Descrip.	Res. Evaluation Form	Academy Background	Site Visit	Remarks
Hospital												
1. Type of institution												
a. university							x				x	
b. public							x				x	
c. private							x				x	
d. combination of public and private							x				x	
2. Mission or role in community												
a. teaching hospital							x				x	
b. clinic							x				x	
c. charity							x				x	
d. community							x				x	
e. military							x				x	
f. children							x				x	
3. Nature of financing							x					
4. Location												
a. extent of urbanization							x	x			x	
b. geographic region							x	x			x	
5. Proximity to other hospitals							x	x			x	
6. Administration												
a. support							x				x	
b. staff							x				x	
c. scheduling system							x				x	
d. record recall							x				x	
7. Library							x					
a. type							x					
b. availability							x					

II.
Setting (cont'd)

	Resident Background	Resident Attitude	Resident Procedures	Res. Eval. Occ. Proc.	Resident Time Log	Attending Att. Ind.	Program Questionnaire	Institutional Data Sp.	Res. Evaluation Form	Academy Background	Site Visit	Remarks
8. Size												
a. number of beds - total and orthopaedic service								x			x	
b. related to patient load								x			x	
1. number of patients								x			x	
2. number of beds								x			x	
3. daily work load								x			x	
4. number of patients in special categories and administrative control												
a. children								x			x	
b. aged								x				
c. adult								x				
d. rehabilitation								x				
e. fractures								x				
f. trauma								x				
g. rheumatoid								x				
h. hand								x				
i. other								x			x	
9. Associated or affiliated institutions								x				
10. Associated or affiliated programs												
a. number							x	x			x	
b. type							x	x			x	
c. nature of relationship								x			x	
d. length of relationship								x			x	
11. Room arrangement												
a. ward								x			x	
b. semi-private								x			x	
c. private								x			x	

II.
Setting (cont'd)

	Resident Background	Resident Attitudes	Resident Procedures	Res. Eval. Oper. Proc.	Resident Time Log	Attending Attitudes	Program Questionnaire	Institutional Descrip.	Res. Evaluation Form	Academy Background	Site Visit	Remarks
B. Support Services												
1. Brace shops								x				
2. Physical therapy								x				
3. Special laboratories								x				
4. Research facilities								x				
5. Other services								x				
6. Perceived adequacy by residents and staff		x					X				x	
7. Social service								x				
8. Multi-discipline								x				
9. X-ray								x				
10. Administrative												
a. medical								x				
b. allied health								x				
C. Operating Rooms												
1. Who schedules operations								x			x	
2. Ancillary personnel assignments								x				
3. Number devoted to orthopaedic surgery								x				
4. Number devoted to all surgery								x				
5. Castroom location								x				
6. Completeness of "hardware"		x						x				
7. Availability of X-ray								x				
8. Anesthesia services								x				
D. Patients												
1. Race and ethnic mix								x			x	
2. Socio-economic status								x			x	
3 Geographic region from which patients are drawn								x			x	

Setting (cont'd)

	Resident Background	Resident [illegible]	[illegible] Experiences	[illegible] Obser. Proc.	Resident [illegible]	[illegible]	Program [illegible]	Institutional [illegible]	Res. [illegible]	Academy Background	Site Visit	Remarks
4. Most common methods patients use to finance care								x			x	
5. Patient turn-over rate								x				
6. Communication ability of patients	x							x			x	
7. Percent returns								x				
8. In patient - out patient ratio								x				
9. Private - non-private patient ratio								x				
10. Admissions routine												
a. screening								x			x	
b. control								x			x	
c. purpose								x			x	
d. responsibility for selection								x			x	
e. division of procedures								x			x	
11. Percent of and needs and requirements												
a. geriatric								x				
b. trauma								x				
c. rehabilitation								x				
d. hand								x				
e. re-constructive								x				
f. multi-discipline								x				
g. children								x				
12. Incidence of pathology												
a. kinds by age of patients								x			x	
b. types by age of patients								x			x	
Follow-up mechanisms for patients												
a. nature								x			x	
b. [illegible]								x				
								x				
								x				
c. [illegible]								x				

II.
Setting (cont'd)

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Remarks
Out Patient Clinics												
1. Number and type								x				
2. Sub-specialties included								x				
3. Support personnel												
a. administrative								x				
b. allied health								x				
4. Relationship to other services		x						x			x	
5. Number of patients												
a. by pathology								x				
b. by age								x				
6. Nature of financing patients								x				
Procedures for Control of												
1. Acute surgical activity												
a. adult								x				
b. children								x				
2. Reconstructive surgical activity												
a. adult								x				
b. children								x				
3. Non-surgical activities												
a. adult								x				
b. children								x				

III.

Residents: Training Variable	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Site Visit	Remarks
Size of resident staff												
1. Number of residents in each year												
a. American							x					
b. foreign							x					
. Proportion of places filled							x					
3. Number of residents at each site							x					
Attitudes and relationship to												
. Paramedical personnel		x										
. Attendings		x										
. Programs		x										
. Perception of objectives		x				x	x					
Payment												
1. Amount							x					
2. By whom paid							x					
. Rate of degree of responsiblity to patients												
1. Procedures done												
a. lab work		x		x	x							
b. ordering X-rays				x	x							
c. ordering therapy				x	x							
d. ordering other treatment				x	x							
e. pre-operative												
1. communication				x								
2. evaluation				x								
f. operating room responsibilities				x								
g. post-operative												
1. communication				x								
2. evaluation				x								
h. defense of therapy				x								
. History and physical					x							
. Consultation activities		x			x						x	

Residents: Training Variable (cont'd)

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Institutional [illegible]	[illegible]	[illegible]	Site Visit	Remarks
Percent of time spent and role in:												
1. Formal learning experiences					x						x	
2. Seminars					x						x	
3. Lectures and conferences					x						x	
4. Research					x						x	
5. Rounds					x						x	
6. Operating room					x						x	
7. "Scut" work					x						x	
8. "Bull sessions"					x						x	
9. Extra curricular activities					x						x	
10. Teaching												
a. medical students					x						x	
b. residents					x						x	
c. paramedical					x						x	
Source of satisfaction and dissatisfaction		x										

V. The Program (Organization)

	Resident Background	Resident Attitude	Resident Procedures	Res. Eval. Oper. Proc.	Resident Time Log	Attending Attitude	Program Questionnaire	Institutional Descrip.	Res. Evaluation Form	Academy Background	Site Visit	Remarks
Number of participating institutions							x	x				
Patterns of rotation												
1. Number available											x	
2. Type											x	
3. Length											x	
4. Location											x	
Relationship to other services											x	
Relationship to program personnel												
1. Paramedical personnel (including nurses)												
a. function of each within the orthopaedic program		x									x	
1. cast room		x									x	
2. brace shop		x									x	
3. clinics		x									x	
4. other support services		x									x	
b. number							x				x	
c. type							x					
Organization of the program												
1. Financing							x					
2. Control of patients (i.e., nature of referral)							x					
3. Rules and regulations regarding residents							x					
4. Methods of selecting residents							x					
5. Definition of "ideal" resident by chief							x				x	
6. Method of disciplining residents							x					
Educational practices												
1. Program objectives as defined by chief							x				x	

7. The Program (Organization) (cont'd)

	Resident Background	Resident Attitude	Resident Procedures	Res. Eval. Oper. Proc.	Resident Time Log	Attending Attitude	Program Questionnaire	Institutional Descrip.	Res. Evaluation Form	Academy Background	Site Visit	Remarks
a. mechanisms for developing, establishing and promulgating objectives							x					
2. Orientation and emphasis on												
a. patient care							x				x	Also, Special Questionnaire
b. research							x				x	
c. teaching							x				x	
d. administration							x				x	
3. Definition of "orthopaedic competence"									x		x	
4. Number and nature of formal learning activities												
a. seminars					x		x					
b. conferences					x		x					
c. rounds					x		x					
d. clinics					x		x					
e. operating room					x		x					
f. other					x		x					
5, Feedback mechanisms												
a. formal					x		x					
b. informal					x		x					Also, Special Questionnaire
6. Use of OITE and other formal evaluation data												

IV.

The Program (Organization) (cont'd)

	Resident Backgrd	Resident Attitude	Resident Prog.	Res. Eval Obs. Proc.	Resident Time Log	Attending Attitude	Program Questionn.	Institutional Ques.	Res. Evaluation	Academy Backgrd	Site Visit	Remarks
7. Mechanisms developed for assumption of responsibility												
a. by year and program			x				x				x	
b. by type of procedures done with and without supervision			x	x			x					
c. nature of responsibility expected of residents			x	x			x				x	
d. employed by												
1. attendings				x			x					
2. paramedical				x			x					
3. fellow residents				x			x					
8. Structure of the program												
a. basic sciences												
1. organization							x					
2. personnel							x					
b. outside courses							x					
9. Standard relationships between residents and staff (supervisory philosophy)												
a. attitudes of paramedical personnel toward												
1. program		x									x	
2. residents		x									x	
3. attendings		x									x	
b. attitudes of residents toward												
a. program		x									x	
b. attendings		x									x	
c. paramedical personnel		x									x	
c. attitudes of attendings toward												
a. residents					x						x	
b. program					x						x	
c. paramedical personnel					x						x	

V.

The Program: The Staff

	Resident Backgr.	Resident Attitude	Res. Procedures	Res. Eval. Oper. Proc.	Resident Time Log	Attending Attitude	Program Question.	Institutional Des.	Res. Evaluation	Academy Backgr..	Site Visit	Remarks
A. Full and part-time attendings												
1. Number and type (geographical, etc.)							x					
2. Source of income and obligations to program,							x					
a. formal							x					
b. informal							x					
3. Areas of specialization											x	
4. Nature of supervision by											x	
5. Reputation												
6. Attitudes of role of orthopaedist as –						x						
a. researcher						x						
b. clinician						x						
c. educator						x						
d. administrator						x						
7. Attitudes toward education											x	
8. Age						x					x	
9. Actual amt. of time spent with residents							x				x	
10. Nature and type of supervision exercised						x						
11. Attitude toward role of med. in society						x					x	
12. Method of interacting with residents						x						
13. List of educational priorities						x						
14. Perception of the ideal resident											x	
15. Pedagogic skill							x				x	
16. Role in financing program												

I. The Outcome Measures: The Resident

	Resident Background	Resident Attitude	Res. Procedures	Res. Eval.Oper. Proc.	Resident Time Log	Attending Attitude	Program Questionnaire	Instit. Description	Res. Evaluation	Academy Background	Site Visit	Remarks
Attitudes												
1. Toward role of orthopaedist as												
a. teacher		x									x	
b. researcher		x									x	
c. clinician		x									x	
d. administrator		x									x	
2. Toward patients		x									x	
3. Toward education												
a. under graduate		x									x	
b. graduate		x									x	
c. continuing		x									x	
4. Toward attendings		x									x	
5. Values		x									x	
6. Interests		x									x	
7. Perceived abilities		x									x	
8. Career aspirations		x									x	
Abilities												
1. Knowledge of medicine									x			OITE and OCE
2. Knowledge of orthopaedics									x			" "
3. Ability to use orthopaedic information to solve orthopaedic problems									x			
4. Ability at patient interviewing									x			
5. Ability to carry out functions of an orthopaedic surgeon - including specific psychomotor skills									x			

TABLE I

Name and Purpose of Instrument	Completed By:	Number on Tape
Program Questionnaire		
To collect detailed descriptive information about relevant program parameters such as size, affiliation, sources of financial support, administrative organization, facilities, patient population, staff resources, program objectives and organization, educational activities, resident responsibilities and the like.	Directors approved programs in Orthopaedics in the U. S.	134 - (1969 collection) 131 - (1971 collection)
Institutional Description Form		
To obtain detailed descriptive information regarding the type of institution, its primary mission, sources of financial support, administrative structure, educational resources, characteristics of the patient population served, interrelations among sub-specialty services, patient care facilities, and supporting services, decision-making process in screening patients for admission and directing their total health care.	Chief of service in institutions affiliated with programs in the study sample.	102
Resident Background Survey		
To obtain detailed descriptive information about the personal background, education, experience and motivation of residents.	Residents in programs included in the study sample.	897 (includes 1st yr res. 1969 and 1971
Resident Attitude Survey		
To obtain data about the attitudes of residents toward patients, colleagues, instructional staff, physical and clinical facilities, the profession and the training program	Residents in programs included in the study sample.	681

TABLE I (Continued)

Name and Purpose of Instrument	Completed By:	Number on Tape
Attending Attitude Survey		
To obtain comparable data (see above) about attitudes of staff.	Attendings in programs included in the study sample.	392
Resident Evaluation Form		
To obtain preceptors' ratings of residents with respect to each of twelve performance factors, related to the several components of competence identified as critical performance requirements.	Directors of Programs participating in the OITE	See exam totals
Candidate Evaluation Form		
To obtain similar information (see above) about each candidate for Board certification.	For each candidate, at least two attendings who have known the candidate over an extended period	See exam totals
Resident Procedures Form		
To obtain detailed data about the resident's experience with, and degree of confidence in his ability to perform, a variety of technical procedures; to identify the setting in which he learned how to perform the procedure and the nature of the supervision under which he learned it. (The form lists over 100 specific diagnostic and therapeutic procedures ranging from those associated with taking a general medical history to those associated with highly technical interventions in the operative management and follow-up of patients	Residents in programs included in the study sample.	614

TABLE X (Continued)

Name and Purpose of Instrument	Completed By:	Number on Tape
Resident Evaluation of Operative Procedures		
To identify the nature of the resident's experience, and the character of his responsibility, with regard to various decision points in the operative management of patients.	Residents in programs included in the study sample.	702
Resident Time Log		
To obtain detailed descriptive data about the work pattern in orthopaedic residency programs, time expended in a variety of activities and amounts of time considered "wasted".	Residents in programs included in the study sample.	521
Orthopaedic In-Training Examination	Certifying Examination	
1967 1968 1969 1970		

ORTHOPAEDIC TRAINING STUDY

Resident Procedures Form

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

RESIDENT
PROCEDURE FORM

prepared by

Center for the Study of Medical Education
University of Illinois

62A

RESIDENT PROCEDURE FORM

|1|3|
1 2

Program:________________ |_|_|_|_| 3 4 5 6

Institution:________________ |_|_|_|_| 7 8 9 10

City:________________ State:________________

AMA Number:________________ |_|_|_|_|_|_|_|_|_|_| 11 12 13 14 15 16 17 18 19 20

Social Security Number:________________ |_|_|_| - |_|_| - |_|_|_|_| 21 22 23 24 25 26 27 28 29

Year of training beyond internship:________________ |_| 30

Name:________________ Last First Middle Date: |__|__|__| Mo. Day Yr. 31-32 33-34

GENERAL DIRECTIONS

Each statement is followed by a series of boxes. Please enter your responses in these boxes according to the instructions on the next page. For some statements there will be no boxes in a column where information is not applicable. This means that this statement does not require a response. Please make sure the above information is complete and legible.

RESIDENT PROCEDURE FORM

The attached form is a general survey of some procedures which are performed by orthopaedic surgeons. It is not a complete listing and it does not imply that every resident should have performed every procedure. Instead, the questionnaire seeks to gather information about the learning processes involved in the acquisition of certain types of orthopaedic skills.

INSTRUCTIONS

After you have completed the biographical data sheets, turn to the procedures listed on the following pages and for each procedure, please indicate by checking (✓) the appropriate column in each section:

A. "When did you first learn" -- refers to that point in your training when you were actually able to perform the procedure without further knowledge or instruction.

B. Approximately, how many times have you actually performed the procedure?

C. At this time, and without further instruction, how well do you think you would be able to perform the procedure?

D. "Who first taught you" is that individual who, either by demonstration or direct supervision, provided you with enough information and guidance to enable you to perform the procedure.

E. If you first performed the procedure without direct supervision or prior demonstration, what methods did you use to teach yourself?

Professional Experience

Code (CSME Use Only) — Column

Please indicate below your professional experience since graduation from medical school.

Internship

Type (e.g. rotating, straight medicine, etc.): ____________________ |_|_| 35-36

Hospital: ____________ City: ____________ State: ____________

Rotations:

Length	Predominant Case Type (e.g. appendectomy, cholecystectomy, etc.)	Code	Column
1st quarter	____________	|_|_|	37-38
2nd quarter	____________	|_|_|	39-40
3rd quarter	____________	|_|_|	41-42
4th quarter	____________	|_|_|	43-44

Residency other than Orthopaedics

Specialty: ____________________ |_|_| 45-46

Rotations (in three-month time segments)

Hospital	City	State	Predominant Case Type (e.g. Plastic, Neurosurgery, etc.)	Code	Column
________	________	________	____________	|_|_|	47-48
________	________	________	____________	|_|_|	49-50
________	________	________	____________	|_|_|	51-52
________	________	________	____________	|_|_|	53-54
________	________	________	____________	|_|_|	55-56
________	________	________	____________	|_|_|	57-58
________	________	________	____________	|_|_|	59-60
________	________	________	____________	|_|_|	61-62

01 in 79-80

Orthopaedic Residency

Rotations (in six-month segments)

Hospital	City	State	Predominant Case Type (e.g. Plastic, Neurosurgery, etc.)	Code	Column
					dup. 1-30
________	________	________	____________	|_|_|	31-32
________	________	________	____________	|_|_|	33-34
________	________	________	____________	|_|_|	35-36
________	________	________	____________	|_|_|	37-38
________	________	________	____________	|_|_|	39-40
________	________	________	____________	|_|_|	41-42
________	________	________	____________	|_|_|	43-44
________	________	________	____________	|_|_|	45-46
________	________	________	____________	|_|_|	47-48
________	________	________	____________	|_|_|	49-50
________	________	________	____________	|_|_|	51-52

Military Duties (Exclusive of Orthopaedic Residency)

Code (CSME Use Only)	Column
|_|_|	53-54

Medical Specialty Practiced during tour of duty: ____________________

Hospital	Post	State	Predominant Case Type (e.g. Plastic, Neurosurgery, etc.)	Code	Column
				|_|_|	55-56
				|_|_|	57-58
				|_|_|	59-60
				|_|_|	61-62
				|_|_|	63-64
				|_|_|	65-66
				|_|_|	67-68
				|_|_|	69-70
					02 in 79-80

Other Professional Experience

Nature of Experience	Dates	City	State

	A When did you first learn? (Check only one)								B Number of times performed? (Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
PROCEDURE	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most peers	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	Dup 1-30
1. Inject a painful joint																														31-40
2. Manipulate a contracted joint																														41-50
3. Debride an open fracture																														51-60
4. Perform split-thickness skin																														61-70
5. Suture a lacerated tendon																														03 in 79-80 Dup 1-30 31-40
6. Repair a lacerated blood vessel																														41-50
7. Apply a bone plate																														51-60
8. Apply a short arm cast																														61-70
9. Apply a long arm cast																														04 in 79-80 Dup 1-30 31-40
10. Apply a shoulder spica cast																														41-50

PROCEDURE	A When did you first learn? (Check only one)								B Number of times performed? (Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most peers	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
11. Reduce a Colles fracture																														51-60
12. Reduce a supra-condylar (humerous) fracture																														61-70
13. Insert a K-wire in a phalanx																														05 in 79-80 Dup 1-30 31-40
14. Release a trigger finger																														41-50
15. Perform a carpal tunnel release																														51-60
16. Perform a wrist synovectomy																														61-70
17. Perform an upper extremity tendon transfer																														06 in 79-80 Dup 1-30 31-40
18. Perform a cross-finger pedicle graft																														41-50

	A When did you first learn? (Check only one)								B Number of times performed? (Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
PROCEDURE	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 – 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most peers	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
19. Repair a lacerated digital nerve																														51-60
20. Write a prescription for corrective shoes																														61-70
21. Prescribe and check-out an A-K prosthesis																														07 in 79-80 Dup 1-30 31-40
22. Apply a short leg walking cast																														41-50
23. Apply a cyliner cast																														51-60
24. Insert a tibial traction pin																														61-70
25. Manipulate a congenital hip dislocation																														08 in 79-80 Dup 1-30 31-40

	A When did you first learn? (Check only one)								B Number of times performed? (Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
PROCEDURE	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most peers	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
26. Non-surgically manage a club foot																														41-50
27. Reduce a traumatic hip dislocation (closed)																														51-60
28. Saucerize an infected tibia																														61-70
29. Internally fix a medial malleolar fracture																														09 in 79-80 Dup 1-30 31-40
30. Perform a knee meniscectomy																														41-50
31. Insert an medullary rod in a femur																														51-60
32. Internally fix a reduced fractured hip																														61-70

	A								B						C				D					E						
	When did you first learn? (Check only one)								Number of times performed? (Check only one)						How well can you perform? (Check only one)				Who first taught you? (Check only one)					If self-taught, what methods did you use? (Check as many as applicable)						CODE
PROCEDURE	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most peers	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
33. Insert a hip prosthesis																														10 in 79-80 Dup 1-30 31-40
34. Perform a hip arthroplasty																														41-50
35. Apply a Minerva jacket																														51-60
36. Apply a corrective cast for scoliosis																														61-70
37. Prescribe and check-out a Milwaukee brace																														11 in 79-80 Dup 1-30 31-40
38. Perform a needle biopsy of a lumbar vertebra																														41-50
39. Take an iliac bone graft																														51-60

PROCEDURE	A When did you first learn? (Check only one)								B Number of times performed? (Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most **peers**	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
40. Perform an innominate osteotomy																														61-70
41. Perform a postero-lateral lumbar fusion																														12 in 79-80 Dup 1-30 31-40
42. Insert Harrington rods																														41-50
43. Perform a laminectomy and discectomy																														51-60
44. Perform a costo-transversectomy																														61-70
45. Perform an anterior cervical fusion																														13 in 79-80 Dup 1-30 31-40
46. Perform a fore quarter or a hind quarter amputation																														41-50

	A When did you first learn? (Check only one)								B Number of times performed?(Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
PROCEDURE	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most peers	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
47. Perform and interpret a myelogram																														51-60
48. Perform and interpret an arthrogram																														61-70
49. Perform and interpret a nerve conduction test																														1[illegible] in 79-80 Dup 1-30 31-40
50. Perform and interpret an EMG																														41-50
51. Insert an endotracheal tube																														51-60
52. Insert a chest tube																														61-70
53. Perform a tracheostomy																														15 in 79-80 Dup 1-30 31-40
54. Manage a patient in shock																														41-50

	A When did you first learn? (Check only one)								B Number of times performed?(Check only one)						C How well can you perform? (Check only one)				D Who first taught you? (Check only one)					E If self-taught, what methods did you use? (Check as many as applicable)						CODE
PROCEDURE	1 Medical student	2 Intern	3 Military or other practice	4 Resident 1st yr.	5 Resident 2nd yr.	6 Resident 3rd yr.	7 Resident 4th yr. or more	8 Never learned	1 Never	2 1 - 5	3 6 - 10	4 11 - 20	5 21 - 30	6 Over 30	1 Don't know	2 Less able than most **peers**	3 As well as most peers	4 As well as most attendings	1 Intern	2 Resident	3 Attending (incl. full time faculty)	4 Self-taught	5 Other	1 Reading	2 Audio-visual aids	3 Anatomical dissections	4 Reasoned it out	5 Trial and error	6 Discussions with others	
55. Perform cardio-respiratory resuscitation																														51-60
56. Give a legal deposition																														61-70
57. Give expert testimony in a court of law																														16 in 79-80 Dup 1-30 31-40
58. Evaluate a disability and report your findings in a form acceptable to a compensation board																														41-50

Please complete within two weeks of receipt. Seal in the attached envelope and deliver to your chief for return to:

Carl Olson, Ed.D., Associate
Office of Research in Medical Education
University of Illinois at the Medical Center
901 South Wolcott Avenue
Chicago, Illinois 60612

Thank you for your cooperation.

Additional Comments

ORTHOPAEDIC TRAINING STUDY

Institutional Description Form

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

INSTITUTIONAL DESCRIPTION FORM

The attached form is designed to provide information to describe your institution, its orthopaedic facilities, and the support services available. It is to be completed by, or under the supervision of, the chief of the orthopaedic service in the institution.

Two copies have been enclosed. One is for your purposes. The second is to be returned, upon completion, within three weeks of receipt, in the attached self-addressed envelope to:

Carl Olson, Ed. D.
Center for the Study of Medical Education
University of Illinois College of Medicine
901 South Wolcott Street
Chicago, Illinois 60612

If you feel that there are important areas not covered, please feel free to add your comments in the space provided at the end of the form.

Thank you for your cooperation.

prepared by

Center for the Study of Medical Education

University of Illinois

April, 1969

INSTITUTIONAL DESCRIPTION FORM

Form |3|1|
1 2

Program: ____________________ |_|_|_|_|
3 4 5 6

Institution: ____________________ |_|_|_|_|
7 8 9 10

City: ____________________ State: ____________________

Name of person completeing this form: ____________________
Last First Initial

Date: ___|___|___
Mo. Day Yr.
11-12 13-14

INSTITUTIONAL DESCRIPTION FORM

1. Type of institution: (please check one)

____1) University
____2) Public
15 ____3) Private
____4) Military
____5) Combination of one or more of the above, please explain ____________
____
____6) Other, please explain ____________
____

2. Mission or role in community: (please check as many as apply)

____1) Teaching hospital
____2) Clinic
____3) Charity hospital
16 ____4) Community hospital
____5) Military hospital
____6) Children's hospital
____7) Other, please specify ____________
____

3. Please indicate, by checking in the appropriate column, the approximate percent of monetary support from each of the following sources: (please check as many as apply)

	(1) 0%	(2) 20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
17 A. Patient fees						
18 B. University budget						
19 C. Private Foundation (Continuing support)						
20 D. Other Foundation (intermittent)						
21 E. Government Grants						

22 F. Other sources, please specify ____________
____
____

Administration

4. Chief administrative officer: (please check one)

____1) Professional hospital administrator
23 ____2) Physician administrator
____3) Other (please specify) ____________

5. Board of directors: (please check one)

____1) Members appointed by official body
____2) Members elected from community at large
____3) Members elected from group of sponsors
24 ____4) Combination of all three of the above
____5) Some members appointed, others elected from community at large
____6) Some members appointed, others elected from group of sponsors
____7) None appointed, members instead are elected from both the community at large and a group of sponsors
____8) Other (please specify) ____________

6. Medical administration organization: (please check one)

____1) Members elected from medical staff
25 ____2) Membership limited to chiefs of services
____3) Other (please specify) ____________

7. Administratiive support: (please check as many as apply)

26 ____1) Nursing supervisor for inpatient services
27 ____2) Nursing supervisor for operating room
28 ____3) Nursing supervisor for emergency room
29 ____4) Nursing supervisor for operating room
30 ____5) Administrative supervisor for inpatient services
31 ____6) Administrative supervisor for operating room
32 ____7) Administrative supervisor for emergency room
33 ____8) Administrative supervisor for outpatient department
34 ____9) Other (please specify)________________________________

8. Record recall

Inpatient records: (please check one)

____1) Record library capable of immediate recall of records pertaining to specific diagnosis and/or specific treatments
35 ____2) Record library capable of immediate recall of records only according to patient's name or identification number
____3) Other (please specify)________________________________

Outpatient records: (please check one)

____1) Record library capable of immediate recall of records pertaining to specific diagnosis and/or specific treatments
36 ____2) Record library capable of immediate recall of records only according to patient's name or identification number
____3) Other (please specify)________________________________

9. Scheduling of special procedures (e.g. myelogram, electroencephalogram, etc.): (please check one)

____1) Done through central booking agent
37 ____2) Done through booking agent in department in which procedure is carried out
____3) Other (please specify)________________________________

10. Library availability for residents: (please check the appropriate number for both hours and distance)

	Hours per day						Distance (mile)			
	(1) <4	(2) 4-8	(3) 8-12	(4) 12-16	(5) >16		(1) <1/4	(2) 1/4-1/2	(3) 1/2-1	(4) >1
38-39						A. Gen'l. University				
40-41						B. Gen'l. Public				
42-43						C. Univ. Med. School				
44-45						D. Private Med. School				
46-47						E. Departmental				
48-49						F. Other (please indicate below)				

F.________________________________

Identify library most used by residents from the list (A through F) given above____________

11. Approximate size of library most used by residents: (please check one volume size and one periodical size)

Books

50 ____1) Less than 25, 000 volumes
____2) 25, 000 - 50, 000 volumes
____3) 60, 000 - 75, 000 volumes
51 ____4) 75, 000 - 100, 000 volumes
____5) More than 100, 000 volumes

Periodicals

____1) Less than 250 current periodicals
____2) 250 - 500 current periodicals
____3) 501 - 750 current periodicals
____4) 751 - 1, 000 current periodicals
____5) More than 100, 000 current periodicals

Inpatient Statistics

12. Total number of beds
52-55 ____1) All services combined
56-58 ____2) Orthopaedic services only

13. Average daily census of inpatients
59-62 ____1) All services combined
63-65 ____2) Orthopaedic services only

14. Approximately what percent of the hospital rooms are in each of the following categories? Please check the appropriate column for each category.

		(1) 0%		(2) 1-20%		(3) 21-40%		(4) 41-60%		(5) 61-80%		(6) 81-100%	
		total	ortho	total	ortho	total	ortho	total	ortho	total	ortho	total	ortho
66-67	A. 4 or more beds												
68-69	B. 2 or 3 beds												
70-71	C. Private, 1 bed												

1 in 80
dup 1-14

15. Please indicate the approximate percent of orthopaedic inpatients in each of the following categories by checking the appropriate column for each category.

		(1) 0%	(2) 20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
15	A. Children						
16	B. Adult						
17	A. Rehabilitation						
18	B. Fractures						
19	C. Trauma						
20	D. Rheumatoid						
21	E. Hand						
22	F. Geriatric						
23	G. Other (please indicate below)						

16. Autopsy rate: (please indicate percent)
24-26 ____% 1) Rate for institution at large
27-29 ____% 2) Rate for orthopaedic service

Administrative Control of Patients

17. Administrative control of Pediatric patients is taken by: (please check one)
30
____1) Is taken by Pediatric Department in hospital
____2) Is taken by that department which customarily attends to the particular disease problem of the individual patient
____3) Other (please specify)____________________

18. Administrative control of Geriatric patients is taken by: (please check one)
31
____1) Is taken by Geriatric Department in hospital
____2) Is taken by that department which customarily attends to the particular disease problem of the individual patient
____3) Other (please specify)____________________

19. Administrative control of Rehabilitation patients is taken by: (please check one)
32
____1) Department of Physical Medicine and Rehabilitation
____2) Department of Orthopaedic Surgery
____3) That department which customarily attends to the particular disease problem of the individual patient
____4) Other (please specify)____________________

81

20. Administrative control of Trauma cases is taken by: (please check one)
____1) Specially designed trauma team
33 ____2) General Surgery
____3) Orthopaedic Surgery
____4) Department which customarily attends to particular trauma problem of individual patient
____5) General Surgery and Orthopaedic Surgery alternately
____6) Other (please specify)________________________________

21. Administrative control of Fracture cases is taken by: (please check one)
____1) General Surgery in all instances
____2) Orthopaedic Surgery in all instances
34 ____3) General Surgery and Orthopaedic Surgery alternately
____4) Other (please specify)________________________________

22. Administrative control of Arthritis patients is taken by: (please check one)
____1) Rheumatology in all instances
____2) Orthopaedics in all instances
35 ____3) Either specialty according to particular need of patient
____4) Other (please specify)________________________________

23. Administrative control of Hand problem patients is taken by: (please check one)
____1) Specially designed hand service
____2) Orthopaedic Surgery in all instances
36 ____3) General or Plastic Surgery in all instances
____4) General or Plastic Surgery and Orthopaedic Surgery alternately
____5) Other (please specify)________________________________

24. Administrative control of Cervical intervertebral disc disease is taken by: (please check one)
____1) Neurosurgery
37 ____2) Orthopaedic Surgery
____3) Neurosurgery and Orthopaedic Surgery alternately
____4) Other (please specify)________________________________

25. Administrative control of Lumbar intervertebral disc disease is taken by: (please check one)
____1) Neurosurgery
38 ____2) Orthopaedic Surgery
____3) Neurosurgery and Orthopaedic Surgery alternately
____4) Other (please specify)________________________________

26. Administrative control of Acute spinal cord injury patients is taken by: (please check one)
____1) Neurosurgery
____2) Orthopaedic Surgery
39 ____3) Both specialties alternately
____4) Specially designed team
____5) Other (please specify)________________________________

27. Administrative control of Chronic spinal cord injury patients is taken by: (please check one)
____1) Neurosurgery
____2) Orthopaedic Surgery
40 ____3) Both specialties alternately
____4) Other (please specify)________________________________

28. Administrative control of Peripheral vascular disease amputation patients is taken by: (please check one)
____1) Orthopaedic Surgery
41 ____2) General Surgery
____3) Orthopaedic Surgery and General Surgery alternately
____4) Other (please specify)________________________________

29. Administrative control of Skeletal deformity or disease amputation patients is taken by: (please check one)
____1) Orthopaedic Surgery
42 ____2) General Surgery
____3) Orthopaedic and General Surgery alternately
____4) Other (please specify)________________________________

30. Administrative control of Musculo-skeletal oncology patients is taken by: (please check one)
____1) An oncology service
43 ____2) Orthopaedic Surgery
____3) Other (please specify)________________________________

31. Convalescent facilities: (please check one)
____1) Formal affiliation exists with one or more convalescent facilities
44 ____2) No formal affiliation exists with such institutions, but they are available in the community
____3) No convalescent facilities are available in the community

32. Custodial care facilities: (please check one)
____1) Formal affiliation exists with one or more custodial care institutions
45 ____2) No formal affiliation exists, but such institutions are available in the community
____3) No custodial care facilities exist in the community

33. Component rehabilitation services (e.g. physical therapy, occupational therapy, etc.): (please check one)
46 ____1) Are under complete control of Department of Physical Medicine
____2) Are under partial control of Department of Orthopaedic Surgery
____3) Are autonomous
____4) Other (please specify)________________________________

34. Please indicate your impressions of each of the following support services. Use the coding below to indicate those impressions. Be sure to respond for each support service.

6 = More than Adequate (or Superior)
5 = Adequate
4 = Marginal
3 = Inadequate
2 = Very Inadequate (or Inferior)
1 = Not Available

47 ____1) Orthotics
48 ____2) Prosthetics
49 ____3) Physical therapy
50 ____4) Occupational therapy
51 ____5) Special clinical laboratories
52 ____6) Research facilities
53 ____7) X-Ray facilities
54 ____8) X-Ray personnel
55 ____9) Rehabilitation facilities
56 ____10) Convalescent hospital
57 ____11) Psychological counseling services
58 ____12) Vocational-rehabilitation counseling services
59 ____13) Social service
60 ____14) Medical administration
61 ____15) Nursing administration
62 ____16) Laboratory administration
63 ____17) Other personnel administration
64 ____18) School facilities for patients
65 ____19) Volunteer services
66 ____20) Non-medical patient services (e.g. TV, telephone, reading materials, recreation facilities, etc.)
67 ____21) Pharmacy services
68 ____22) Other (please specify)________________________________

Operating Rooms

35. Number of operating rooms:
69-70 ____1) Total, all services
71-72 ____2) Orthopaedics only

36. Scheduling of elective operations: (please check one)
____1) Scheduled by individual service chiefs through a central booking agent on the operating room staff
73 ____2) Scheduled by individual surgeons (attending or resident) through a central booking agent on the operating room staff
____3) Scheduled by individual service chiefs through chief surgical officer
____4) Scheduled by individual surgeons (attending or resident) through chief surgical officer

37. Scheduling of emergency operations: (please check one)
74 ____1) Done by arrangement between individual surgeon (or chief of service) and operating room personnel
____2) Done by arrangement between individual surgeon (or chief of service) and chief surgical officer, who assigns priority

38. Assignment of nursing and technical personnel: (please check one)
____1) Done according to availability of personnel
75 ____2) Done according to specialization of personnel
____3) Combination of above

39. Scheduling of elective operations by service: (please check one)
____1) Service assigned specific day(s) and responsible for booking and timing of schedule
76 ____2) Service assigned specific day(s) but booking and timing done through operating room scheduling agency
____3) Service not assigned specific day, booking and timing done through operating room scheduling agency
____4) Other (please specify)________________

40. Operating room control: (please check one)
____1) Hospital
77 ____2) General Surgery
____3) Individual specialties
2 in 80 dup 1-14 ____4) Other (please specify)________________

41. Location of cast room: (please check as many as apply)
15 ____1) In surgical suite
16 ____2) In emergency receiving room
17 ____3) In outpatient department
18 ____4) Elsewhere (please specify)________________

42. Selection of Orthopaedic Appliances Routinely Available:
For each of the following appliances use the code below to indicate their availability.
4 = Adequate assortment readily available
3 = Minimum assortment readily available
2 = Must be procured for each use
1 = Surgeon must supply

	Appliance	4	3	2	1
19	A. General Bone Instruments (e.g. periosteal elevators, osteotomes, gouges, etc.)				
20	B. Internal Fixation Devices (e.g. plates, intramedullary nails, etc.)				
21	C. Endoprostheses				
22	D. Special Appliances (e.g. compression units, spinal instrumentation equipment, etc.)				
23	E. Power Equipment (electrical or air driven)				

43. Surgical X-ray facilities: (please check one)
____1) Equipment and technicians assigned specifically to operating room routinely
24 ____2) Equipment and technicians summoned to operating room from X-ray department as needed
____3) No X-ray available in operating room
____4) Other (please specify)____________________

44. Anesthesia services (General anesthesia): (please check as many as apply)
25 ____1) Anesthesiologist(s) administer all anesthesia
26 ____2) Nurse anesthetist(s) administer anesthesia, under supervision of anesthesiologist(s)
27 ____3) Nurse anesthetist(s) administer all anesthesia, with no supervision
28 ____4) Personnel in training

45. Anesthesia services (Local and Regional Anesthesia): (please check one)
____1) Anesthesia service administers all local or regional anesthetics
29 ____2) Surgical service administers all local or regional anesthetics
____3) Both services may administer local or regional anesthetics

Admissions

46. Scheduling of admissions from attendings' private offices: (please check one)
____1) Admissions scheduled through central booking agent by individual physician according to general bed availability
30 ____2) Admissions scheduled through central booking agent by individual physician according to specific service and availability
____3) Other (please specify)____________________

47. Scheduling of all other admissions: (please check one)
31 ____1) Admissions scheduled through central booking agency by service chief according to general bed availability
____2) Admissions scheduled through central booking agency by service chief according to specific service bed availability
____3) Other (please specify)____________________

48. Are residents granted authority to arrange admissions without specific acknowledgement by superior (e.g. chief resident, attending)? (please check one)
32 ____1) Yes
____2) No
____3) Other (please specify)____________________

49. Screening of patients: (please check one)
33 ____1) Specific screening criteria are used to secure admission of only those patients whose problems are of value for teaching purposes
____2) Specific screening criteria are used to secure admission of adequate numbers of teaching cases
____3) Specific screening done for purposes other than teaching purposes. If so, please explain.____________________
____4) No specific screening is done

50. Please estimate the approximate percent of inpatients in each of the following categories by checking the appropriate column for each category.

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
34	A. English speaking						
35	B. Non-English Speaking						
36	A. Negro						
37	B. Caucasian						
38	C. American Indian						
39	D. Oriental						
40	E. Other, please explain below						

____
____

51. Communication skills of patients

Please estimate the percentage of your patient population in the following categories:

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
41	Communicate well						
42	Communicate marginally						
43	Communicate poorly						

52. Patients' ability to understand and comply with directions.

Please estimate the percentage of your patient population defined by the following categories:

		(1) 0%		(2) 1-20%		(3) 21-40%		(4) 41-60%		(5) 61-80%		(6) 81-100%	
		W	O	W	O	W	O	W	O	W	O	W	O
44-45	Satisfactory												
46-47	Marginal												
48-49	Unsatisfactory												

W = Written
O = Oral

53. Interpreter services

Please estimate by checking the appropriate column for each category, the availability (% of time) of interpreter services for non-English-speaking patients.

		(1) 0%		(2) 1-20%		(3) 21-40%		(4) 41-60%		(5) 61-80%		(6) 81-100%	
	Patients	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
50-51	Full range of languages covered												
52-53	Major languages covered												
54-55	Few languages covered												
56-57	No languages covered												

54. Please indicate the approximate percent of inpatients from each of the following socio-economic groups by checking the appropriate column for each group.

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
58	A. Upper class						
59	B. Middle and Upper Middle						
60	C. Lower Middle and Upper Lower class						
61	D. Lower class						

55. Please indicate the approximate percent of inpatients from each of the following geographic classifications:

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
62	A. Metropolitan area over 1, 000, 000						
63	B. Urban area 500, 000-1, 000, 000						
64	C. Metropolitan area suburbs						
65	D. Urban area suburbs						
66	E. Cities 250, 000-500, 000						
67	F. Cities 100, 000-250, 000						
68	G. Towns 50, 000-100, 000						
69	H. Towns 25, 000-50, 000						
70	I. Towns 10, 000-25, 000						
71	J. Rural communitites 5, 000-10, 000						
72	K. Rural communities under 5, 000						
73	L. Rural, unincorporated						

3 in 80
dup 1-14

56. Financing of inpatient care--approximate percent using each type:

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
15	A. Private insurance						
16	B. Group insurance						
17	C. Own resources						
18	D. A and C						
19	E. B and C						
20	F. Charity (Indigent)						
21	G. Medicare						
22	H. Other, please indicate below:						

____

57. What percent of patients return when requested?

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
23	A. Never return						
24	B. Return once						
25	C. Regularly return						
	D. Return irregularly						

Outpatient Clinics

28-33 58. Medical: Number of annual outpatient visits: ____________(please check as many as apply)

34 ____1) General medical
35 ____2) Cardiology
36 ____3) Renal disease
37 ____4) Metaboloic disorders
38 ____5) Diabetes
39 ____6) Other (please specify______________________________

40-44 59. Surgical: Number of annual outpatient visits: ____________(please check as many as apply)

45 ____1) General surgery
46 ____2) Plastic surgery
47 ____3) Neurosurgery
48 ____4) Obstetrics
49 ____5) Gynecology
50 ____6) Urology
51 ____7) Otolaryngology
52 ____8) Ophthalmology
53 ____9) Other (please specify)______________________________

54-57 60. Oncology: Number of annual outpatient visits:__________ (please check as many as apply)
58 ____1) General oncology
59 ____2) Chemotherapy
60 ____3) Radiotherapy

61-66 61. Pediatrics: Number of annual outpatient visits:__________(please check as many as apply)
67 ____1) Well-baby clinic
68 ____2) General pediatrics
69 ____3) Metabolic disorder
70 ____4) Neurologic disorder
71 ____5) Other (please specify)______________________________
4 in 80
dup 1-14 62. Arthritic: Number of annual outpatient visits:__________(please check as many as apply)
19 ____1) Medical only
20 ____2) Combined medical and surgical

21-24 63. Neurology: Number of annual outpatient visits:__________(please check as many as apply)
25 ____1) General
26 ____2) Subspecialty (please specify)______________________________

27-31 64. Psychiatry: Number of annual outpatient visits:__________(please check as many as apply)
32 ____1) General
33 ____2) Subspecialty (please specify)______________________________

34-38 65. Orthopaedic: Number of annual outpatient visits:________(please check as many as apply)
39 ____1) General orthopaedics
40 ____2) Adult orthopaedics
41 ____3) Pediatric orthopaedics (including crippled children)
42 ____4) Hand
43 ____5) Hip
44 ____6) Amputation and prosthetics
45 ____7) Rehabilitation
46 ____8) Scoliosis
47 ____9) Spine (other than scoliosis)
48 ____10) Neurologic orthopaedics
49 ____11) Arthritis
50 ____12) Other (please specify)______________________________

66. Financing of outpatient department operation

Please indicate by checking in the appropriate column the approximate percent of monetary support from each of the following sources:

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
51	A. Patient fees						
52	B. University budget						
53	C. Private foundation						
54	D. Government, federal						
55	E. Government, local						
56	F. Non-govt., third party						
57	G. Other, please indicate below						

below ______________________________
____

Support Services

67. Please indicate which of the following support services are part of the Outpatient Department (please check as many as apply)

58 ____1) Orthotics
____2) Prosthetics
____3) Physical therapy
____4) Occupational therapy
____5) Clinical laboratories
____6) X-Ray facilities
____7) Rehabilitation facilities
____8) Psychological counseling services
____9) Vocational-rehabilitation counseling services
____10) Social service
____11) Volunteer services
____12) Pharmacy services
____13) Home nursing services
71 ____14) Other (please specify)____________________

5 in 80
dup 1-14 68. Please indicate which of the following personnel and the number, who are regularly assigned to the outpatient orthopaedic clinic: (please check as many as apply)

15-17 ____1) Registered nurse Number________
18-20 ____2) Practical nurse Number________
21-23 ____3) Nurse's aide Number________
24-26 ____4) Orderlies Number________
27-29 ____5) Plaster technician Number________
30-32 ____6) Social worker Number________

Clerical support services

69. In-patient records and activities: (please check as many as apply)
33 ____1) Secretarial service available to house staff
34 ____2) Typing pool available to house staff
35 ____3) Clerical research assistant available to house staff
36 ____4) Liason clerk for communication with community resources available
37 ____5) No clerical services available to house staff
38 ____6) Other (please specify)____________________

70. Outpatient records and activities: (please check as many as apply)
39 ____1) Secretarial service available to house staff
40 ____2) Typing pool available to house staff
41 ____3) Clerical research assistant available to house staff
42 ____4) Liason clerk for communication with community resources available
43 ____5) No clerical services available to house staff
44 ____6) Other (please specify)____________________

6 in 80 ADDITIONAL COMMENTS

ORTHOPAEDIC TRAINING STUDY

Resident Attitude Survey

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

RESIDENT ATTITUDE SURVEY

The purpose of the attached Resident Attitude Survey is to identify variations in attitudes among residents, both within and between programs.

We have tried to cover many different points of view, so you may agree strongly with some statements and disagree with others. However you feel, you can be certain that many people believe as you do.

Be sure to respond to each statement with YOUR opinion. The best response to each statement is YOUR personal opinion. There are no "right" or "wrong" responses. Respond quickly; your immediate reaction to a statement is probably the best one. Statements which do not apply (i. e., no students on this rotation, etc.) should be left blank.

Thank you for your cooperation.

prepared by

Center for the Study of Medical Education
University of Illinois

April, 1969

RESIDENT ATTITUDE SURVEY

|1|1|
1 2

Program: ______________________________ |_|_|_|_|
3 4 5 6

Institution: ______________________________ |_|_|_|_|
7 8 9 10

City: ____________________ State: ____________________

AMA Number |_|_|_|_|_|_|_|_|_|_|
11 12 13 14 15 16 17 18 19 20

Social Security Number |_|_|_| - |_|_| - |_|_|_|_|
21 22 23 24 25 26 27 28 29

Year of Training Beyond Internship |_|
30

Name: ______________________________ Date: ___|___|___
Last First Middle
Mo. Day Yr.
31-32 33-34

DIRECTIONS

Respond to each of the following statements by using the coded scale shown below. To indicate your reaction to each statement circle the number which most closely corresponds to YOUR feeling about that statement.

Coded Scale

1 = Strongly Disagree
2 = Disagree
3 = Tend to Disagree
4 = Tend to Agree
5 = Agree
6 = Strongly Agree

Please be sure to respond to each applicable statement! !

1 = Strongly Disagree
2 = Disagree

3 = Tend to Disagree
4 = Tend to Agree

5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
1. Residents play a major role in teaching on my service.	1 2 3 4 5 6	35
2. My residency is primarily a learning experience as opposed to a teaching experience.	1 2 3 4 5 6	36
3. Time spent arranging to have laboratory tests done detracts from time I could use on some more productive areas.	1 2 3 4 5 6	37
4. Residents do too many menial tasks on my service.	1 2 3 4 5 6	38
5. The full-time faculty in my department understands and appreciates the contributions of the resident.	1 2 3 4 5 6	39
6. I am resigned to serving my residency to meet specialty board requirements.	1 2 3 4 5 6	40
7. Evaluation of a resident is based primarily on surgical skill.	1 2 3 4 5 6	41
8. My service is known as a "residents' service".	1 2 3 4 5 6	42
9. Most residents are primarily interested in lining up a practice.	1 2 3 4 5 6	43
10. Students on my service hinder the performance of my duties.	1 2 3 4 5 6	44
11. Regularly scheduled resident meetings are a valuable educational activity.	1 2 3 4 5 6	45
12. Private patients are valuable to me because they enable me to see sophisticated, intelligent patients.	1 2 3 4 5 6	46
13. I have sufficient opportunity to work closely with the senior (attending) staff.	1 2 3 4 5 6	47
14. Specialty board requirements are in general too rigid.	1 2 3 4 5 6	48
15. Hospital personnel in paramedical areas are as well trained in their fields as are physicians in theirs.	1 2 3 4 5 6	49
16. Residents are exploited by the hospital and its attending physicians.	1 2 3 4 5 6	50
17. Residents do too much research.	1 2 3 4 5 6	51
18. The attendings in my department exert a strong effort toward making the residents' experience a valuable one.	1 2 3 4 5 6	52
19. Since physicians in training are grossly underpaid, a man is justified in charging high fees when he goes into practice.	1 2 3 4 5 6	53
20. The morale of the resident staff is low.	1 2 3 4 5 6	54
21. I have sufficient opportunity to develop and use my operative skills in this residency program.	1 2 3 4 5 6	55
22. Having students around causes me to "read up" more than I might have done otherwise.	1 2 3 4 5 6	56
23. I feel that the residents' assignments are determined primarily by a need to provide "service" to patients.	1 2 3 4 5 6	57
24. Experience with private patients is valuable to me in spite of limitations in my responsibility for them.	1 2 3 4 5 6	58
25. Paramedical personnel have too much control over a resident's activities.	1 2 3 4 5 6	59
26. Residents are given the feeling that they can make a significant contribution to improving the performance of interns.	1 2 3 4 5 6	60

1 = Strongly Disagree
2 = Disagree

3 = Tend to Disagree
4 = Tend to Agree

5 = Agree
6 = Strongly Agree

STATEMENT	RESPONSES	Col.
27. The number of private patients on my service is inadequate.	1 2 3 4 5 6	61
28. Residents try to excite the curiosity of students.	1 2 3 4 5 6	62
29. I have too much night duty.	1 2 3 4 5 6	63
30. Residents have the feeling that their work is an important activity.	1 2 3 4 5 6	64
31. There are too many ward (charity, service, indigent) patients admitted on my service.	1 2 3 4 5 6	65
32. My department is generally regarded as having a "stimulating" teaching staff.	1 2 3 4 5 6	66
33. It was known to the residents that this residency program had been organized with specific objectives in mind.	1 2 3 4 5 6	67
34. The full-time staff in my department places great emphasis on the practical management of problems.	1 2 3 4 5 6	68
35. We have too little elective time on my service.	1 2 3 4 5 6	69
36. Work of the residents is rarely reviewed by other physicians.	1 2 3 4 5 6	70
37. Attendings consciously strive to improve their performance as teachers.	1 2 3 4 5 6	71
38. Setting a good example is the best way for a resident to contribute to a person's education.	1 2 3 4 5 6	72
39. Senior residents, chief residents and fellows should have academic appointments.	1 2 3 4 5 6	73
40. There is a congenial relationship between most of the attendings and residents on my service.	1 2 3 4 5 6	74
41. Residents are helped to understand the source of important problems they may be facing.	1 2 3 4 5 6	75
42. Having to teach takes time away from more important things I want to do.	1 2 3 4 5 6	76
43. Attending physicians are practice and patient oriented rather than scientifically oriented.	1 2 3 4 5 6	77
44. The presence of students on my service makes it a better "teaching service".	1 2 3 4 5 6	78
45. Most residents here make an effort to keep up with the current medical literature.	1 2 3 4 5 6	79 1 in 80 dup 1-30
46. All residents should have an academic appointment as well as a hospital appointment.	1 2 3 4 5 6	31
47. When I began my assignment on this specialty, the resident's role was made clear to me.	1 2 3 4 5 6	32
48. What is best for the patients is considered in making decisions affecting educational programs.	1 2 3 4 5 6	33
49. I now believe this residency would be better without students.	1 2 3 4 5 6	34
50. Residents are open and free about exchanging information.	1 2 3 4 5 6	35
51. Teaching students how to perform certain procedures helps to improve my own technique.	1 2 3 4 5 6	36

1 = Strongly Disagree
2 = Disagree
3 = Tend to Disagree
4 = Tend to Agree
5 = Agree
6 = Strongly Agree

	STATEMENTS	RESPONSES	Col.
52.	Instruction from the full-time faculty is too empiric.	1 2 3 4 5 6	37
53.	Clinical laboratory services at this hospital are adequate and available without much difficulty.	1 2 3 4 5 6	38
54.	Constructive suggestions are offered to residents in dealing with their major problems	1 2 3 4 5 6	39
55.	Evaluation of the residents goes on constantly.	1 2 3 4 5 6	40
56.	Residents are willing to help out when a fellow resident has a great deal of work to do.	1 2 3 4 5 6	41
57.	Residents play a minor role in teaching.	1 2 3 4 5 6	42
58.	The full-time attendings who have private patients usually give the resident the opportunity to make most decisions in the patient's work-up and care.	1 2 3 4 5 6	43
59.	My service is known as an "interns' service".	1 2 3 4 5 6	44
60.	It is difficult to determine the effectiveness of residents.	1 2 3 4 5 6	45
61.	The presence of students probably doesn't affect my learning one way or the other.	1 2 3 4 5 6	46
62.	"Moonlighting" is necessary for me to meet basic financial needs for my family.	1 2 3 4 5 6	47
63.	Evaluation of a resident is based primarily on clinical judgment.	1 2 3 4 5 6	48
64.	The residents and attendings in my program generally do not mix socially.	1 2 3 4 5 6	49
65.	The full-time faculty places great emphasis on pathogenesis and pathophysiology.	1 2 3 4 5 6	50
66.	The best way for a resident to teach students is to have formal conferences with them.	1 2 3 4 5 6	51
67.	Instruction from the full-time faculty is too theoretical or abstract.	1 2 3 4 5 6	52
68.	Demands on the resident are so great they are almost impossible to meet.	1 2 3 4 5 6	53
69.	On my service, the resident should play a role in evaluation of residents junior to himself.	1 2 3 4 5 6	54
70.	I have sufficient opportunity to develop and use my clinical skills during residency.	1 2 3 4 5 6	55
71.	The residents get along together socially	1 2 3 4 5 6	56
72.	If I had it to do over again, I would select this residency program.	1 2 3 4 5 6	57
73.	The different skills found in the attendings are fully utilized.	1 2 3 4 5 6	58
74.	The most important aspect of my residency is treating patients.	1 2 3 4 5 6	59
75.	I could be a great deal more effective as a resident.	1 2 3 4 5 6	60
76.	Residents are treated as professional workers.	1 2 3 4 5 6	61
77.	My service is the best one in the hospital.	1 2 3 4 5 6	62
78.	My service is student oriented.	1 2 3 4 5 6	63

1 = Strongly Disagree
2 = Disagree
3 = Tend to Disagree
4 = Tend to Agree
5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
Most of what I have learned thus far has been from:		
79. My chief of service	1 2 3 4 5 6	64
80. Various attendings	1 2 3 4 5 6	65
81. Residents senior to me	1 2 3 4 5 6	66
82. Residents junior to me	1 2 3 4 5 6	67
83. Paramedical personnel	1 2 3 4 5 6	68
84. Most of what I have learned thus far has not been supervised to my satisfaction.	1 2 3 4 5 6	69
85. The attending staff is sufficiently aware of my performance to render an accurate evaluation of my work.	1 2 3 4 5 6	70
		2 in 80

Please complete within two weeks of receipt. Seal in the attached envelope and deliver to your chief for return to:

Carl Olson, Ed. D.
Office of Research in Medical Education
University of Illinois at the Medical Center
901 South Wolcott
Chicago, Illinois 60612

Thank you for your cooperation.

Additional Comments

ORTHOPAEDIC TRAINING STUDY

Attending Attitude Survey

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

ATTENDING ATTITUDE SURVEY

The purpose of the attached Attending Attitude Survey is to identify variations in attitudes among attendings both within and between programs.

We have attempted to cover many different points of view, so you may agree strongly with some statements and disagree with others. However you feel, you can be certain that many people believe as you do.

The best response to each statement is your own opinion, and your immediate response is more important than a carefully considered one.

Thank you for your cooperation.

prepared by

Center for the Study of Medical Education
University of Illinois
June, 1969

ATTENDING ATTITUDE SURVEY

|_2_|_1_|
1 2

Program: ________________________________ |__|__|__|__|
3 4 5 6

Institution: ________________________________ |__|__|__|__|
7 8 9 10

City: ____________________ State ____________________

AMA Number: ____________________ |__|__|__|__|__|__|__|__|__|__|
11 12 13 14 15 16 17 18 19 20

Social Security Number: ____________________ |__|__|__| - |__|__| - |__|__|__|__|
21 22 23 24 25 26 27 28 29

Please indicate in the boxes to the right the approximate per cent of time per week you spend in activities directly related to resident training. (1/2 day per week equals 10%.) |__|__|__|%
30 31 32

Please indicate below the nature of these educational activities:
(please check as many as apply)

(33)____1) Ward rounds
(34)____2) Clinic supervision
(35)____3) Grand rounds
(36)____4) Operating Room supervision
(37)____5) Individual conferences with residents
(38)____6) Special lectures
(39)____7) Attendance at national and state meetings
(40)____8) Other (please specify)____________________

Name: ________________________________ Date: ___|___|___|
Last First Mid. Initial Mo. Day Yr.
41-42 43-44

DIRECTIONS

Respond to each of the following statements by using the coded scale shown below. To indicate your reaction to each statement circle the number which most closely corresponds to YOUR FEELING about that statement.

Coded Scale

1= Strongly Disagree
2= Disagree
3= Mildly Disagree
4= Mildly Agree
5= Agree
6= Strongly Agree

Please be sure to respond to each statement!!

1 = Strongly Disagree
2 = Disagree
3 = Mildly Disagree
4 = Mildly Agree
5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
1. The most important activity in a residency program is the teaching of orthopaedics.	1 2 3 4 5 6	45
2. In a good orthopaedic residency program the material to be learned is specified.	1 2 3 4 5 6	46
3. The most effective teacher has a personal interest in the progress of each resident.	1 2 3 4 5 6	47
4. Mastery of orthopaedic subject matter is the prime requisite for retention in the program.	1 2 3 4 5 6	48
5. Effective teaching is enhanced by "getting to know" the residents well.	1 2 3 4 5 6	49
6. Residents learn more from other residents than they do from attendings.	1 2 3 4 5 6	50
7. Residents should be grounded in orthopaedic knowledge before being allowed to exercise independent responsibility.	1 2 3 4 5 6	51
8. Residents respect attendings who expect them to work hard.	1 2 3 4 5 6	52
9. Skillful teaching can increase a resident's interest in orthopaedics.	1 2 3 4 5 6	53
10. The residents' service responsibilities are useful for learning orthopaedics.	1 2 3 4 5 6	54
11. Basic science courses prepare residents for understanding orthopaedic problems.	1 2 3 4 5 6	55
12. Residents learn research procedure best by doing research.	1 2 3 4 5 6	56
13. Attendings should make the decisions in patient management.	1 2 3 4 5 6	57
14. The best way to present a case is as a problem to be solved.	1 2 3 4 5 6	58
15. Attendings should make allowances for individual differences when teaching residents.	1 2 3 4 5 6	59
16. Only a few attendings are capable of effective teaching.	1 2 3 4 5 6	60
17. Residents should participate in the planning of the program's educational activities.	1 2 3 4 5 6	61
18. The service needs of this program are overemphasized.	1 2 3 4 5 6	62
19. Attendings who respect residents encourage participation in planning patient management.	1 2 3 4 5 6	63
20. Good teaching cases relate isolated problems with overall goals of orthopaedic management.	1 2 3 4 5 6	64

1 = Strongly Disagree
2 = Disagree
3 = Mildly Disagree
4 = Mildly Agree
5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
21. The contrasting skills and interests of residents makes team work a profitable experience.	1 2 3 4 5 6	65
22. Teaching on ward rounds is usually impractical.	1 2 3 4 5 6	66
23. Teaching residents is best done by giving organized lectures.	1 2 3 4 5 6	67
24. An attending can "reach" an uncooperative resident by taking a personal interest in his situation.	1 2 3 4 5 6	68
25. Attendings should have an overall plan of program objectives to use in their work with residents.	1 2 3 4 5 6	69
26. Residents should be given more freedom in designing their own programs	1 2 3 4 5 6	70
27. Resident morale is maintained when open communication is possible.	1 2 3 4 5 6	71
28. Demonstrated interest in a resident's progress increases his productivity.	1 2 3 4 5 6	72
29. Follow-up is as important a learning experience for residents as is acute management.	1 2 3 4 5 6	73
30. Teaching residents is a valuable activity.	1 2 3 4 5 6	74
31. There should be an outline of the material to be covered in the residency program.	1 2 3 4 5 6	75
32. Heavy service demands impose a stereotyped approach to patient management.	1 2 3 4 5 6	76
33. Residents should have more supervision than they get.	1 2 3 4 5 6	77
34. Residents can be stimulated by being given freedom to develop their own interests.	1 2 3 4 5 6	78
35. The deliberate use of sarcasm in teaching activities is harmful.	1 2 3 4 5 6	79 1 in 80 dup 1-44
36. When given a choice of activities, residents generally select what is best for them.	1 2 3 4 5 6	45
37. All conferences should be free from interruptions.	1 2 3 4 5 6	46
38. Basic science courses are often irrelevant.	1 2 3 4 5 6	47
39. Well-established hospital routines allow the residents to plan their own study time.	1 2 3 4 5 6	48

1 = Strongly Disagree
2 = Disagree

3 = Mildly Disagree
4 = Mildly Agree

5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
40. Learning is a process of increasing one's store of specific facts about orthopaedics.	1 2 3 4 5 6	49
41. Attendings are more effective when they maintain proper "professional distance" between residents and themselves.	1 2 3 4 5 6	50
42. Residents learn to stay alert when they are expected to respond immediately to demands.	1 2 3 4 5 6	51
43. Heavy patient loads make teaching residents difficult.	1 2 3 4 5 6	52
44. Residents gain more satisfaction from doing a difficult task well than from any other achievement.	1 2 3 4 5 6	53
45. Residents should be evaluated on attitudes as well as on achievement.	1 2 3 4 5 6	54
46. Attendings should be prepared to demonstrate the relationship between basic information and clinical problems.	1 2 3 4 5 6	55
47. Residents respect attendings who stand firm on their convictions.	1 2 3 4 5 6	56
48. The quality of the teaching program has no effect on the residents' interest in orthopaedics.	1 2 3 4 5 6	57
49. Residents should do a research project during residency.	1 2 3 4 5 6	58
50. Residents learn best in an atmosphere of mutual respect.	1 2 3 4 5 6	59
51. Surgical skill is best developed by a progressively difficult sequence of cases.	1 2 3 4 5 6	60
52. Discipline is necessary for maintaining resident productivity.	1 2 3 4 5 6	61
53. Residents who repeatedly disrupt program routine should be dismissed.	1 2 3 4 5 6	62
54. Under ideal conditions residents should view each attending as a "specialist" in the subject matter taught.	1 2 3 4 5 6	63
55. Attendings should use a resident's previous experience in deciding what he should do on a new rotation.	1 2 3 4 5 6	64
56. Attendings should not allow a resident to become unduly specialized early in his training	1 2 3 4 5 6	65
57. The most realistic guide for residency training is based on an ordered classification of orthopaedic information.	1 2 3 4 5 6	66
58. Residents learn the best surgical technique by observing in the operating room.	1 2 3 4 5 6	67
59. The attitudes of a resident can be changed during a residency,	1 2 3 4 5 6	68

1 = Strongly Disagree
2 = Disagree

3 = Mildly Disagree
4 = Mildly Agree

5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
60. The goals of the residency program should be determined by the residents' interests and needs.	1 2 3 4 5 6	69
61. Attendings adequately meet their teaching responsibilities just by providing patients.	1 2 3 4 5 6	70
62. The major function of the resident is to assist in getting the work done.	1 2 3 4 5 6	71
63. A good residency program integrates the basic sciences with clinical problems.	1 2 3 4 5 6	72
64. Residents should concentrate on learning the procedures used in this institution.	1 2 3 4 5 6	73
65. Unusual cases make the best teaching material.	1 2 3 4 5 6	74
66. Individual differences should be accommodated in planning the overall program of each resident.	1 2 3 4 5 6	75
67. The most effective teaching of residents occurs in organized conferences.	1 2 3 4 5 6	76
68. Residents learn clinical judgment best by observing the attendings arrive at decisions.	1 2 3 4 5 6	77
69. Residents master information when they prepare topics for conference presentation.	1 2 3 4 5 6	78
70. Attendings should participate in the teaching program if they wish to have residents working on their service.	1 2 3 4 5 6	79 2 in 80 dup 1-44
71. Learning conditions are optimal when the social and emotional needs of residents are being met.	1 2 3 4 5 6	45
72. The research residents do is usually a waste of time.	1 2 3 4 5 6	46
73. All an attending needs, to be a good teacher, is an extensive knowledge of orthopaedics.	1 2 3 4 5 6	47
74. The residents' service responsibilities interfere with their learning.	1 2 3 4 5 6	48
75. Developing surgical skill is the most important function of a residency program.	1 2 3 4 5 6	49
76. The resident's impression of an attending's personality influences what he learns from that attending.	1 2 3 4 5 6	50
77. An attending who becomes involved in the personal problems of residents loses his effectiveness as a teacher.	1 2 3 4 5 6	51
78. Teaching sessions should be held after the day's work is done.	1 2 3 4 5 6	52

1 = Strongly Disagree
2 = Disagree
3 = Mildly Disagree
4 = Mildly Agree
5 = Agree
6 = Strongly Agree

STATEMENTS	RESPONSES	Col.
79. Patient management experience aids residents in the development of suitable attitudes toward patients.	1 2 3 4 5 6	53
80. Most residents can learn an adequate amount of orthopaedics in spite of deficiencies in a teaching program.	1 2 3 4 5 6	54
81. Attending professional meetings and special courses is an important way for residents to learn.	1 2 3 4 5 6	55
82. Hospital routines restrict a resident's individual curiosity.	1 2 3 4 5 6	56
83. The best way to present a case is to give a detailed account of what was done and why it was done.	1 2 3 4 5 6	57
84. Residents do not usually cover the important material without some prodding.	1 2 3 4 5 6	58
85. Residents learn most efficiently by being required to assume responsibility for patient care.	1 2 3 4 5 6	59
86. Mature residents learn more on their own initiative than under tight supervision.	1 2 3 4 5 6	60

Please complete within two weeks of receipt. Seal in the attached envelope and deliver to your chief for return to:

Carl Olson, Ed. D.
Office of Research in Medical Education
University of Illinois at the Medical Center
901 South Wolcott
Chicago, Illinois 60612

Thank you for your cooperation.

ADDITIONAL COMMENTS

RESIDENT EVALUATION
of
OPERATIVE PROCEDURES

RESIDENT EVALUATION OF OPERATIVE PROCEDURES

This form is intended to elicit comments about YOUR experiences with the operative management of patients on your rotation at THIS time. Your answers should reflect the procedures and practices employed by the majority of attendings with whom YOU work directly. Sections I through IV are concerned with all scheduled (non-emergency) surgery. Section V is concerned with all emergency surgery and Section VI with general management.

prepared by
Center for the Study of Medical Education
University of Illinois

April, 1969

RESIDENT EVALUATION OF OPERATIVE PROCEDURES

INSTRUCTIONS

Please read the entire form before selecting any responses. Your comments regarding NOTABLE EXCEPTIONS may be listed at the end of each section. You may mark your responses with a (✓) in the appropriate column(s). Check one box in EACH column for EACH question to indicate the ways in which patients are managed. Most hospitals serve several different types of patients (third-party pay, private, etc.); use Column A for the most prevalent patient type, Column B for the second most prevalent type. Please list below the characteristics of these two major groups of patients.

Type A Patients Are:______________________________

____

Type B Patients Are:______________________________

____

Do not
write in
this col

Card col

|1|6|
1 2 — 1-2

Name:______________________________ Date: |___|___|___| — 3-6
Mo. Day Yr.
3-4 5-6

Program:______________________________ |__|__|__|__| — 7-10
7 8 9 10

Year of Residency (after internship): |__| — 11
11

Present Rotation: — 12

____1) Children's
____2) Trauma
____3) Adult
____4) Hand
____5) Rehabilitation
____6) Research
____7) Other (please specify)____________________

Location of Rotation: Institution________________________ |__|__|__|__| — 13-16
13 14 15 16

City:____________________ State:____________________

107

I. PRE-OPERATIVE DECISIONS

	Patients A	Patients B	Do not write in this col Card col
1. The INITIAL decision to manage a patient operatively and utilize a specific operative procedure is usually made by:			(1 or 0)
a. Attending(s) (Go to Question 2)	☐	☐	17-18
b. Resident(s) (Go to Question 3)	☐	☐	19-20
c. Attending(s) and resident(s) jointly (Go to Question 4)	☐	☐	21-22
2. The attending(s) decision is usually:			
a. Not discussed with residents	☐	☐	23-24
b. Discussed with residents	☐	☐	25-26
a) BEFORE informing them of the decision	☐	☐	27-28
b) AFTER informing them of the decision	☐	☐	29-30
c. Other (please specify)__________ (Go on to Question 5)	☐	☐	31-32
3. The resident(s) decision is usually:			
a. Reviewed in detail by attending(s)	☐	☐	33-34
b. Reviewed in part by attending(s)	☐	☐	35-36
c. Accepted without review	☐	☐	37-38
d. Not presented to attending(s)	☐	☐	39-40
e. Reviewed by other resident(s)	☐	☐	41-42
f. Other (please specify)__________ (Go on to Question 5)	☐	☐	43-44
4. The decision of the attending(s) and resident(s) is:			
a. Arrived at jointly after discussion between attending(s) and resident	☐	☐	45-46
b. Initiated by attending(s) THEN confirmed with resident(s)	☐	☐	47-48
c. Initiated by resident(s) THEN confirmed with attending(s)	☐	☐	49-50
d. Made by resident(s) who must justify decision with attending(s)	☐	☐	51-52
e. Other (please specify)__________	☐	☐	53-54

NOTABLE EXCEPTIONS:______________________________

____

____

____

____

II. PRE-OPERATIVE MANAGEMENT

	Patients A	B	Do not write in this col. Card col.
			(1 or 0)
5. Once the operative decision has been made, pre-operative management is usually controlled by:			
a. Attending who writes orders without consultation	☐	☐	55-56
b. Resident who writes orders without consultation	☐	☐	57-58
c. Pre-prescribed routines	☐	☐	59-60
d. Resident who writes orders in consultation with other resident(s)	☐	☐	61-62
e. Other (please specify)____________________	☐	☐	63-64
6. Immediate pre-operative medications are usually initiated and ordered by:			
a. Anesthesia staff without consultation	☐	☐	65-66
b. Orthopaedic service without consultation	☐	☐	67-68
c. Anesthesia after consultation with orthopaedics	☐	☐	69-70
d. Other (please specify)____________________	☐	☐	71-72 1 in 80
7. Determining whether the proper equipment and materials for the procedure are available in the operating room is usually done by:			dup 1-16
a. The attending	☐	☐	17-18
b. The resident	☐	☐	19-20
c. The resident and checked by the attending	☐	☐	21-22
d. Operating room staff	☐	☐	23-24
e. Other (please specify)____________________	☐	☐	25-26

NOTABLE EXCEPTIONS:____

____

____

____

____

III. OPERATIVE MANAGEMENT

	Patients		Do not write in this col.
	A	B	Card col.
8. At operation, the attending is usually:			(1 or 0)
a. Present, scrubbed and performs operative procedure	☐	☐	27-28
b. Present, scrubbed and assisting the resident in performing the procedure	☐	☐	29-30
c. Present, scrubbed and observing	☐	☐	31-32
d. Present but not scrubbed	☐	☐	33-34
e. Present in area and available if needed but not in operating room	☐	☐	35-36
f. Absent, not in the area, not available	☐	☐	37-38
g. Other (please specify)____________________	☐	☐	39-40
9. At operation, the preparation and draping of the patients is usually:			
a. Done by the attending	☐	☐	41-42
b. Directed by the attending	☐	☐	43-44
c. Decided upon and done by resident after consultation with attending	☐	☐	45-46
d. Done by resident without consultation	☐	☐	47-48
e. Done by nursing staff	☐	☐	49-50
f. Other (please specify)____________________	☐	☐	51-52
10. In EXPOSING the actual operative field or site, usually the			
a. Attending performs the majority of this part of the procedure	☐	☐	53-54
b. Resident performs the majority of this procedure with			
a) Step by step guidance of the attending	☐	☐	55-56
b) Occasional comments from the attending	☐	☐	57-58
c) Attending acting as assistant only	☐	☐	59-60
d) Attending acting as observer only	☐	☐	61-62
c. Resident is in complete charge with attending			
a) Not present in operating room but available	☐	☐	63-64
b) Not present, not available	☐	☐	65-66
d. Other (please specify)____________________	☐	☐	67-68
11. After the site has been exposed, the operative procedure itself (not including ancillary procedures such as obtaining grafts, etc.) is usually done by the			2 in 80 (1 or 0) dup 1-16
a. Attending who performs the procedure	☐	☐	17-18
b. Resident who performs the procedure with	☐	☐	19-20
a) Step by step guidance of attending	☐	☐	21-22
b) Occasional comments from attending	☐	☐	23-24
c) Attending acting as assistant only	☐	☐	25-26
d) Little or no comment from the attending	☐	☐	27-28
c. Resident is in complete charge with attending not present	☐	☐	29-30
d. Other (please specify)____________________	☐	☐	31-32

III. OPERATIVE MANAGEMENT (Cont'd.)

	Patients A	Patients B	Do not write in this col card col. (1 or 0)
12. Any ancillary procedure(s) (such as obtaining grafts, etc.) required is usually done by the:			
a. Attending who performs the procedure	☐	☐	33-34
b. Resident who performs the procedure with	☐	☐	35-36
a) Step by step guidance of attending	☐	☐	37-38
b) Occasional comments from attending	☐	☐	39-40
c) Attending acting as assistant only	☐	☐	41-42
d) Little or no comment from the attending	☐	☐	43-44
c. Resident is in complete charge with attending not present	☐	☐	45-46
d. Other (please specify)____________________	☐	☐	47-48
13. During closure after this part of the procedure is complete, and prior to application of dressing or cast, usually the			
a. Attending performs the majority of this part of the procedure	☐	☐	49-50
b. Resident performs the majority of this part of the procedure with	☐	☐	51-52
a) Step by step guidance of attending	☐	☐	53-54
b) Occasional comments from attending	☐	☐	55-56
c) Attending acting as assistant only	☐	☐	57-58
d) Little or no comment from the attending	☐	☐	59-60
c. Resident is in complete charge with attending not present	☐	☐	61-62
d. Other (please specify)____________________	☐	☐	63-64
14. Post-operatively (e.g. while applying a cast, applying dressing, etc.) in the operating room, usually the			(1 or 0) dup 1-16
a. Attending performs the majority of this part of the procedure	☐	☐	17-18
b. Resident performs the majority of this part of the procedure with	☐	☐	19-20
a) Step by step guidance of attending	☐	☐	21-22
b) Occasional comments from attending	☐	☐	23-24
c) Attending acting as assistant only	☐	☐	25-26
d) Little or no comment from the attending	☐	☐	27-28
c. Resident is in complete charge with attending not present	☐	☐	29-30
d. Other (please specify)____________________	☐	☐	31-32
15. In the event of complications in the operating room, usually the			
a. Attending assumes (or continues) complete control immediately	☐	☐	33-34
b. Attending allows resident to continue with closer supervision	☐	☐	35-36
c. Attending allows resident to continue without closer supervision	☐	☐	37-38
d. Attending allows resident to assume more control	☐	☐	39-40
e. Attending is not present in operating room	☐	☐	41-42
f. Other (please specify)____________________	☐	☐	43-44

NOTABLE EXCEPTIONS:____

IV. POST-OPERATIVE MANAGEMENT

	Patients A	 B	Do not write in this col Card col (1 or 0)
16. Post-operatively, the management of the patient is usually directed by:			
a. Attending only	☐	☐	45-46
b. Resident(s) only	☐	☐	47-48
c. Pre-prescribed routines	☐	☐	49-50
d. Resident(s) who write orders in consultation with attending	☐	☐	51-52
e. Resident who writes orders in consultation with other resident(s)	☐	☐	53-54
f. Resident(s) who write orders without consultation	☐	☐	55-56
g. Other (please specify)____________________	☐	☐	57-58
17. Following the operative procedure the actions of the resident(s) are usually			
a. Not evaluated or discussed by attending	☐	☐	59-60
b. Evaluated by the attending without discussion	☐	☐	61-62
c. Are discussed and evaluated in conjunction with attending	☐	☐	63-64
d. Left to the resident to discuss with other residents	☐	☐	65-66
e. Other (please specify)____________________	☐	☐	67-68
NOTABLE EXCEPTIONS:____________________			4 in 80

____

____

____

____

V. EMERGENCY MANAGEMENT

	Patients A	 B	
18. In emergency situations (other than during routine operating hours) the definitive management decision is usually:			(1 or 0) dup 1-16
a. Postponed whenever possible until regular hours	☐	☐	17-18
b. Routinely handled as soon as possible	☐	☐	19-20
c. Other (please specify)____________________	☐	☐	21-22
19. The emergency operative management decisions are usually made by:			
a. Attendings who are present	☐	☐	23-24
b. Residents with telephone consultation with attendings	☐	☐	25-26
c. Residents with consultation of other resident(s)	☐	☐	27-28
d. Other (please specify)____________________	☐	☐	29-30

NOTABLE EXCEPTIONS:______________________________

____

____

____

____

Do not
write in
this col
Card col.

VI. GENERAL MANAGEMENT

Using the following code, write one number in each column for each item to indicate the attention given the following factors prior to, or following, a procedure:

Use the following code to respond to the remaining factors:

1 Not explicitly discussed or enumerated
2 Enumerated by attending without discussion
3 Enumerated by resident without discussion
4 Discussed by resident(s) and attending(s)
5 Discussed by resident(s)

		Patients		
		A	B	
20.	The nature of actual or potential complications	☐	☐	31-32
21.	The management of actual or potential complications	☐	☐	33-34
22.	The steps in basic operative procedure employed	☐	☐	35-36
23.	The pathology of the case	☐	☐	37-38
24.	The basic principles of handling tissues	☐	☐	39-40
25.	The basic principles of instruments and equipment employed	☐	☐	41-42
26.	The rehabilitation of the patient	☐	☐	43-44
27.	The degree of "success" of a procedure	☐	☐	45-46
28.	The prognosis for the patient	☐	☐	47-48

NOTABLE EXCEPTIONS:______________________________

______________________________ 5 in 80

Please complete within two weeks of receipt. Seal in the attached envelope and deliver to your chief for return to:

Carl Olson, Ed. D.
Office of Research in Medical Education
University of Illinois at the Medical Center
901 South Wolcott
Chicago, Illinois 60612

Thank you for your cooperation.

Additional Comments

ORTHOPAEDIC TRAINING STUDY

Program Questionnaire

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

PROGRAM QUESTIONNAIRE

The attached form is designed to gather information which describes the characteristics of your orthopaedic residency program. It is to be completed by, or under the supervision of, the chief of the program.

This form is similar to one completed by your office two years ago; the data obtained on this form will be used in part to determine the extent to which programs have changed during this period of time.

If you feel that there are important areas not covered, please feel free to add your comments on the pages provided at the end of the questionnaire.

Please return the completed form within two weeks of receipt in the attached self-addressed envelope to:

Carl J. Olson, Ed.D., Coordinator
Center for Educational Development
University of Illinois College of Medicine
901 South Wolcott Street
Chicago, Illinois 60612

Thank you for your cooperation.

prepared by
Center for Educational Development
University of Illinois

August, 1971

PROGRAM QUESTIONNAIRE

Form 3 2
1 2

Program: ______________________________ |_|_|_|_|
3 4 5 6

Program Chief: ______________________________
Last First Initial

Administrative location of program:

______________ ______________ ______________
Institution City State

University Affiliations, if any:

University	City	State

Name and location of all hospitals in Program:

ORME Use only Code	Hospital	City	State
7 10			
11 14			
15 18			
19 22			
23 26			
27 30			
31 34			
35 38			
39 42			
43 46			
47 50			
51 54			
55 58			
59 62			
63 66			

Date: __________ | __________ | __________ |
Month 67-68 Day Year 69-70

1 in 80

dup.
1-6

PROGRAM QUESTIONNAIRE

1. Status of program in parent institution: (please check one)
____1) Department of orthopaedic surgery in a medical school
____2) Department of orthopaedic surgery in a non-university hospital
7 ____3) Division of department of surgery in a medical school
____4) Division of department of surgery in a non-university hospital
____5) Other (please specify)________________________________

2. Medical school affiliation: (please check one)
____1) No medical school affiliation. (Please skip to question 4.)
____2) Affiliated
8 ____3) Member department in a medical school

3. Medical school type: (please check one)
____1) Public but non-university
____2) Public and university
9 ____3) Private but non-university
____4) Private and university

4. Geographic organization of program: (please check one)
____1) Entire program organized in one institution
____2) Program organized in several institutions in one geographic locale
10 ____3) Program organized in several institutions some of which are located in distant geographic regions
____4) Other (please specify)________________________________

5. Function of chief of program: (please check one)
____1) Direct control over all facets of program
11 ____2) Parts of control delegated to chiefs of service of constituent parts of program
____3) Other (please specify)________________________________

6. Preparation and training of chief of program: (please check as many as apply)
12 ____1) Orthopaedic residency and certification, only
13 ____2) Graduate level degree in clinical or basic science related to orthopaedics in addition to residency
14 ____3) Graduate level degree in medical education in addition to residency
15 ____4) Fellowship training after residency in special area of orthopaedic interest
16 ____5) Other (please specify)________________________________

7. Position of chief of program: (please check one)
____1) No academic rank, no tenure available
____2) No academic rank, but tenure available
17 ____3) Has academic rank, no tenure available
____4) Has academic rank, and tenure is available
____5) Other (please specify)________________________________

8. Geographic availability of chief of program: (please check one)
____1) Major office located in principal institution of program
____2) Major office located immediately adjacent to principal institution of program
18 ____3) Major office located at a distance of less than one mile from principal institution of program
____4) Major office located at a distance of more than one mile from principal institution of program

9. Chiefs of service: (please check as many as apply)
19 ____1) Chiefs of service belong to same practice group as chief of program
20 ____2) Chiefs of service hold academic rank
21 ____3) Chiefs of service completely independent of control of chief of program
22 ____4) Other (please specify)________________________________

10. **Financial remuneration of chief of program: (please check one per line)**

	(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
23 Approximate percent of income from salary	___	___	___	___	___	___
24 Approximate percent of income from practice	___	___	___	___	___	___

11 **Concerning remuneration of staff: (please check one)**

____1) Limits are imposed on the amount of practice earned income

25 ____2) No limits are imposed on the amount of practice earned income

____3) Other (please specify)______________________________

12. **Attending staff (full and/or part time)**

26-28 Total number________________

Indicate the number of persons on the attending staff who are described by each of the following categories:

		Number of persons
29-30	A. 75% or more of working time is concerned in some way with resident education	________
31-32	B. Private practice with 25% or less of time devoted to resident education	________
33-34	C. Research activities with 25% or less of time devoted to resident teaching	________
35-36	D. Number with total income from salary	________
37-38	E. Number with total income from practice	________
39-40	F. Number with clearly identifiable commitment to teaching	________

13. **Activities of attending staff.**

Please indicate what percent of attending staff work time is committed to the following activities: (please check one in each line)

		(1) 0%	(2) 0-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
	Full time staff:						
41	Administrative	___	___	___	___	___	___
42	Clinical	___	___	___	___	___	___
43	Research	___	___	___	___	___	___
44	Formal teaching (rounds, conferences, surgery, etc.)	___	___	___	___	___	___
	Part-time staff:						
45	Administrative	___	___	___	___	___	___
46	Clinical	___	___	___	___	___	___
47	Research	___	___	___	___	___	___
48	Formal teaching (rounds, conferences, surgery, etc.)	___	___	___	___	___	___

14. Primary orientation of attending staff as related to work in resident training program. (please check one)
____1) Community service
____2) Orthopaedic education
49 ____3) Private purposes
2 in 80 ____4) Research
dup 1-6

15. Resident staff Total ____________

7-8 List number of residents in each category

Year of training after internship

		1	2	3	4	5	over 5
9-19	Presently authorized	____	____	____	____	____	____
20-30	Current occupancy	____	____	____	____	____	____
31-42	No. American graduates	____	____	____	____	____	____
43-54	No. foreign graduates	____	____	____	____	____	____

16. Do the residents have an academic appointment? (please check one)
____1) Yes
55 ____2) No
____3) Other (please specify)________________________________

17. Are applicants for residency who are vulnerable to military induction during training time span accepted into program? (please check one)
56 ____1) Yes
____2) No

18. In selecting residents, is preference given to graduates of the affiliated medical school? (please check one)
____1) Yes
57 ____2) No
____3) No affiliated medical school

19. In selecting residents, please RANK the following considerations in order of their importance in the decision to select a candidate. (Place the number "1" opposite the most important consideration, the number "2" opposite the next, etc.)

58 ____1) Academic standing in medical school
59 ____2) Performance during internship
60 ____3) Recognized humanitarianism
61 ____4) Recognized technical aptitude
62 ____5) Recognized intellectual approach to problems
63 ____6) Recognized interest in research
64 ____7) Emotional maturity
65 ____8) Other (please specify)________________________________

20. Annual resident income:

66-67

(66)	(67)
First two years (please check one)	Second two years (please check one)
____1) $1000-$2500	____1) $1000-$2500
____2) $2501-$5000	____2) $2501-$5000
____3) $5001-$7500	____3) $5001-$7500
____4) $7501-$10, 000	____4) $7501-$10, 000
____5) Over $10, 000	____5) Over $10, 000

21. Fellowship staff (other than residents). Number of persons: (please check one)
____1) None
68 ____2) 1 to 4
____3) 5 to 10
____4) 11 or more

22. Major function of fellowship staff: (please check one)
____1) Clinical work
____2) Research
69 ____3) Private study
____4) Other (please specify)____________________

23. Educational activities of fellowship staff: (please check one)
____1) None
____2) 25% of time given to resident teaching
70 ____3) 50% of time given to resident teaching
____4) Other (please specify)____________________

24. Ancillary personnel whose services are routinely and readily available: (check as many as apply)
71 ____1) Psychiatrist(s)
72 ____2) Physical therapist(s)
73 ____3) Occupational therapist(s)
74 ____4) Social worker(s)
75 ____5) Prosthetist(s)
76 ____6) Orthotist(s)
77 ____7) Other (please specify)____________________

3 in 80
dup 1-6 25. Professional consultants whose services are routinely and readily available: (please check one)
____1) Full range of medical specialists
7 ____2) Major specialties only
____3) Specialists not available for practical purposes
____4) Other (please specify)____________________

26. Program length: (please check one)
____1) Three years orthopaedics following twelve months general surgery
8 ____2) Four years orthopaedics following internship
____3) Other (please specify)____________________

27. Program design: (please check one)
____1) Offers complete training in orthopaedics as standardly defined
9 ____2) Offers complete training in orthopaedics plus options for development of more specialized interests
____3) Offers partial training in orthopaedic surgery but provides formal arrangements, for training in those areas not specifically covered, in other programs

28. Program continuity: (please check one)
____1) Training offered in one institution with one attending staff
10 ____2) Training offered in more than one institution but attending staff at the different institutions consists essentially of the same persons
____3) Training offered in more than one institution and each institution has a different staff

29. Program objectives: (Please RANK 1, 2 and 3 in order of importance to program)
11 ____1) Production of community practice oriented orthopaedists
12 ____2) Production of orthopaedic subspecialists or academicians
13 ____3) Production of basic research oriented orthopaedists

30. Clinical material sources for entire program: (please check one per line)

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
14	Private patients	____	____	____	____	____	____
15	Non-private patients	____	____	____	____	____	____

31. Clinical material variety during entire program: (please check one per line)

		(1) 0%	(2) 1-20%	(3) 21-40%	(4) 41-60%	(5) 61-80%	(6) 81-100%
16	Trauma	____	____	____	____	____	____
17	Adult general orthopaedics	____	____	____	____	____	____
18	Pediatric general orthopaedics	____	____	____	____	____	____
19	Rehabilitation	____	____	____	____	____	____

32. Which of the following rotations are included either during the year of general surgery before entering a three year program, or at some time during a four year program? (please check all that apply)

21 ____1) Plastic surgery
22 ____2) Neurosurgery
23 ____3) Throacic surgery
24 ____4) General trauma
____5) Other (please specify)________________________________

33. Which of the following out patient clinics are included in your program? (please specify)

25 ____1) General orthopaedics
26 ____2) Fracture
27 ____3) Children's
28 ____4) Scoliosis (NOTE: Separate from Children's)
29 ____5) Hip
30 ____6) Amputation and Prosthetics
31 ____7) Arthritis
32 ____8) Other (please specify)________________________________

34. Is there a follow-up clinic in which patients who were treated in the remote past (i.e. more than five years) are brought back for review so that the natural history of orthopaedic disease may be studied? (please check one)

____1) Yes
33 ____2) No

35. Orthopaedic subspecialists available in attending staff: (please check as many as apply)

34 ____1) None
35 ____2) Rehabilitation
36 ____3) Bio-mechanics
37 ____4) Orthopaedic pathology
38 ____5) Hand surgery
39 ____6) Neurologic disorders
40 ____7) Pediatric orthopaedics
41 ____8) Spine
42 ____9) Other (please specify)________________________________

36. Types of associated facilities in program: (please check as many as apply)

43 ____1) Private community hospital
44 ____2) V.A. hospital
45 ____3) Charity hospital
46 ____4) Crippled children's hospital
47 ____5) Hospital for use of clinic practice group
48 ____6) Other (please specify)________________________________

37. Clinical teaching: (please check as many as apply)
49 ____1) Bedside teaching rounds conducted on regularly scheduled basis, at least once weekly
50 ____2) Group conference rounds conducted on regularly scheduled basis, at least once weekly
51 ____3) Surgical sessions supervised by an instructor
52 ____4) Outpatient clinics supervised by an instructor
53 ____5) Specialty clinics supervised by an instructor
54 ____6) Emergency room activities supervised by an instructor
55 ____7) Didactic meetings not directly related to current patient population (concerned with general orthopaedic knowledge) conducted on regularly scheduled basis, at least once weekly.
56 ____8) Other (please specify)____________________

38. Basic science instruction: (please check one)
____1) Basic science instruction offered within program and integrated throughout length of program
57 ____2) Basic science instruction offered within program during a restricted period of time as an autonomous course
____3) Basic science course offered at separate and distinct program as an autonomous course
____4) Other (please specify)____________________

39. Teaching activities of resident: (please check as many as apply)
58 ____1) Residents required to instruct other residents
59 ____2) Residents required to instruct interns
60 ____3) Residents required to instruct medical students
61 ____4) Residents required to instruct nurses, physical therapist or other allied health professionals
62 ____5) Other (please specify)____________________

40. Research activities of residents: (please check one)
____1) Submitting clinical or laboratory research paper mandatory to complete program requirements
63 ____2) Submitting research paper optional
____3) Other (please specify)____________________

41. If research paper is mandatory: (please check one)
____1) Period of time is alloted specifically for research
64 ____2) Investigation is done concurrently with clinical work
____6) Other (please specify)____________________

42. Resident participation in national orthopaedic community: (please check as many as apply)
65 ____1) Attendance at at least one annual national meeting is mandatory
66 ____2) Attendance at national meetings optional
67 ____3) Presentation of papers at national meetings actively encouraged
68 ____4) Other (please specify)____________________

43. Management of resident training: (please check one)
____1) Close supervision according to predetermined formulae
69 ____2) Liberal allowance for individual activity beyond basic training requirements
____3) Other (please specify)____________________

44. Are residents regularly advised of rate of progress and areas of deficiency? (please check one)
____1) Yes
70 ____2) No

4 in 80

dup. 1-6

45. Concerning resident responsibilities for patient care, please indicate the level at which a resident is usually allowed full medical (but not necessarily legal) responsibility for critical decisions in the management of the following types of problems: (please check one in each row)

Year of training beyond internship

		1	2	3	4	5	Never
7	A. Frequently encountered types of "out-patient" trauma (e.g. simple metatarsal fracture)	____	____	____	____	____	____
8	B. Frequently encountered types of "in-patient" but non-operative trauma (e.g. fracture of pelvis)	____	____	____	____	____	____
9	C. Frequently encountered types of surgical trauma (e.g. hip fracture)	____	____	____	____	____	____
10	D. Simple reconstructive surgical procedures (e.g. elective bunionectomy)	____	____	____	____	____	____
11	E. Complex reconstructive surgical problems (e.g. hip arthoplasty)	____	____	____	____	____	____

46. Surgical experience of resident: (please check one)

____1) Resident begins performing simple orthopaedic operations at beginning of residency and progresses systematically towards the more complex procedures with increments in experience

12

____2) Resident functions chiefly as assistant in surgery until final year when he begins performing orthopaedic operations of variety of complexity

____3) Resident begins performing operations of variety of complexity at beginning of residency and continues throughout program

____4) Other (please specify)________________________________

47. Resident supervision in surgery: (please check one)

____1) Resident supervision in operating room is provided by attending, fellow or senior resident in accordance with the needs of the individual resident surgeon for a given procedure

13 ____2) Resident supervision in surgery provided for all cases regardless of complexity

____3) Other (please specify)________________________________

48. Disposition of resident personnel: (please check one)

____1) All senior resdients share responsibilities

14 ____2) Some senior residents have more responsible assignments than others

49. Upon completion of four year program, do some residents continue in supervisory positions for additional training experiences? (please check one and enter number if yes)

15 ____1) Yes. If so, how many per year |__|__|

16 17

16-17 ____2) No

50. In the last two years, how many residents failed to complete the program because

18 check as many as apply and enter the number for each group checked in the space provided)

____1) Their performance was judged unacceptable. Number |__|__|

19-20 (NOTE: Residents who were considered unacceptable should be listed here even though they may have continued orthopaedic training elsewhere.)

21 ____2) The resident decided on his own initiative to seek orthopaedic training in another program.

22-23 Number |__|__|

24 ____3) The resident decided to seek a career other than orthopaedics. Number |__|__|

25-26

27 ____4) Other (please specify)________________________________

51. If there were residents judged unacceptable, the reason was: (please check as many as apply) and enter number)

28-30 ____1) Technical ineptitude. Number |__|__|

31-33 ____2) Inability to master information required. Number |__|__|

34-36 ____3) Poor clinical judgment. Number |__|__|

37-39 ____4) Moral and ethical irresponsibility. Number |__|__|

40 ____5) Other (please specify)________________________________

5 in 80

ADDITIONAL COMMENTS

RESIDENT TIME LOG

CODING USE ONLY
|1|5|
1 2

PLEASE PRINT OR TYPE ALL INFORMATION!

Program Appointed To:
________________________ |_|_|_|_|
3 6

Chief's Name:________________

Please list the Primary Hospital of your current Rotation:

________________________ |_|_|_|_|
7 10

A.M.A. Med. Educ. No. |________________|
11 - 20

Social Security No. |_____ - _____ - _____|
21 - 29

Year of Training Beyond Internship |____|
30

Name:________________________
Last First Initial

City:______________ State:______________

Date Log Started: |__|__| - |__|__| - 19|7|__|
Month 31-32 Day 33-34 Year 35-36

COMMENTS

ORTHOPAEDIC TRAINING STUDY
RESIDENT TIME LOG

DIRECTIONS

1. PLEASE PRINT OR TYPE ALL INFORMATION REQUESTED ON PAGE 6!
   Enter the date you begin the Log. In all instances this should be a SUNDAY.

2. At the end of each day approximate the number of hours spent in each category listed on page 2. If you are engaged in a task which is described by 2 or more categories, enter the time spent opposite each category. For example, if you were performing surgery and teaching a junior resident for 2½ hours, you would enter 2½ in both CATEGORY VI and CATEGORY VII. Daily totals may therefore exceed 24 hours.

   Please make all entries to the nearest half (½) hour.

3. For time logged in Category XVI - WASTED TIME and Category XVII - OTHER, please complete page 5.

4. When you have completed the log for 7 consecutive days and pages 5 and 6, seal in the envelope provided and return to your orthopaedic departmental office or chief for return to:

Carl J. Olson, Ed.D., Associate
Center for Educational Development
University of Illinois at the Medical Center
901 South Wolcott Avenue
Chicago, Illinois 60612

Prepared by:

Center for Educational Development
Formerly Office of Research in Medical Education
University of Illinois at the Medical Center

CATEGORY XVI - WASTED TIME

Please list those tasks which you consider to be wasted time and were logged in Category XVI - WASTED TIME. If they occur frequently, please check the box preceding the number.

Coding Only
Dupl-30

☐ 1. ____________________ |_|_|
31 32 33
☐ 2. ____________________ |_|_|
34 35 36
☐ 3. ____________________ |_|_|
37 38 39
☐ 4. ____________________ |_|_|
40 41 42
☐ 5. ____________________ |_|_|
43 44 45

CATEGORY XVII - OTHER

Please specify below those tasks logged in Category XVII - OTHER. If they occur frequently, please check the box preceding the number.

Coding Only

☐ 1. ____________________ |_|_|
46 47 48
☐ 2. ____________________ |_|_|
49 50 51
☐ 3. ____________________ |_|_|
52 53 54
☐ 4. ____________________ |_|_|
55 56 57
☐ 5. ____________________ |_|_|
58 59 60

10 in 79-80

RESIDENT TIME LOG

CODING USE ONLY
|1|5|
1 2

PLEASE PRINT OR TYPE ALL INFORMATION!

Program Appointed To:

____________________ |_|_|_|_|
3 6

Chief's Name: ____________________

Please list the Primary Hospital of your current Rotation:

____________________ |_|_|_|_|
7 10

A.M.A. Med. Educ. No. |____________________|
11 - 20

Social Security No. |______ - ______ - ______|
21 - 29

Year of Training Beyond Internship |____|
30

Name: ____________________
Last First Initial

City: ____________ State: ____________

Date Log Started: |__|__| - |__|__| - 19|7|__|
Month 31-32 Day 33-34 Year 35-36

COMMENTS

ORTHOPAEDIC TRAINI
RESIDENT TIME

DIRECTION

1. PLEASE PRINT OR TYPE A
REQUESTED ON PAGE 6!
Enter the date you begin the
this should be a SUNDAY.

2. At the end of each day appro
hours spent in each category
you are engaged in a task wh
or more categories, enter th
each category. For example
forming surgery and teaching
for 2½ hours, you would ente
CATEGORY VI and CATEGO
may therefore exceed 24 hou

Please make all entries to th

3. For time logged in Category
and Category XVII - OTHER,
page 5.

4. When you have completed the
days and pages 5 and 6, seal
provided and return to your
mental office or chief for ret

Carl J. Olson, Ed. D.,
Center for Educational
University of Illinois a
901 South Wolcott Aven
Chicago, Illinois 6061

Prepared by

Center for Educational
Formerly Office of Research i
University of Illinois at the

TYPICAL ACTIVITIES IN EACH CATEGORY	SUN.	MON.	TUES.	WED.	THUR.	FRI.	SAT.	CODING ONLY
History and physical, work rounds, plaster work, special procedures (e.g. myelograms), etc.								37-57 1 in 80
Care provided in out-patient clinic, history, physical, etc.								Dup 1-30 31-51
Treatment provided in emergency room setting (e.g. plaster, suturing, etc.)								52-72 2 in 80
Present in Operating Room but neither assisting nor performing surgery.								Dup 1-30 31-51
Acting as 1st, 2nd, or 3rd assistant in Operating Room.								52-72 3 in 80
Time spent developing the approach, performing the intended procedure, and/or closing the wound.								Dup 1-30 31-51
Formal or informal instruction of junior residents, interns, medical students, nurses, etc.								52-72 4 in 80
Conferences, lectures, teaching rounds, basic science sessions, meetings, etc.								Dup 1-30 31-51
General medical reading, special reading to prepare for surgery, etc. (NOT research literature review)								52-72 5 in 80
All activities related to clinical or laboratory research projects, and the literature review for same.								Dup 1-30 31-51
Chart writing, discharge summaries, dictating letters, insurance forms, telephoning for patient appointments, completing miscellaneous forms, scheduling patients, etc.								52-72 6 in 80
To and from work, between hospitals during day, etc.								Dup 1-30 31-51
Reserve meetings, National Guard meetings, etc.								52-72 7 in 80
All employment not part of formal residency program. See accompanying letter. Not Reported To Programs.								Dup 1-30 31-51
All activities not related to professional activities								52-72 8 in 80
Enter description of what this constitutes on page 5.								Dup 1-30 31-51
Those activities which occupied $\frac{1}{2}$hour or more during any day, and which were necessitated by your work, but are not accurately described by any of the above.								52-72 9 in 80

CATEGORIES	TYPICAL ACTIVITIES IN EACH CATEGORY	SUN.	MON.	TUES.	WED.	THUR.	FRI.
I. IN-PATIENT CARE	History and physical, work rounds, plaster work, special procedures (e.g. myelograms), etc.						
II. OUT-PATIENT CARE	Care provided in out-patient clinic, history, physical, etc.						
III. EMERGENCY ROOM CARE	Treatment provided in emergency room setting (e.g. plaster, suturing, etc.)						
IV. OBSERVING SURGERY	Present in Operating Room but neither assisting nor performing surgery.						
V. ASSISTING SURGERY	Acting as 1st, 2nd, or 3rd assistant in Operating Room.						
VI. PERFORMING SURGERY	Time spent developing the approach, performing the intended procedure, and/or closing the wound.						
VII. TEACHING	Formal or informal instruction of junior residents, interns, medical students, nurses, etc.						
VIII. ATTENDING SCHEDULED LEARNING ACTIVITIES	Conferences, lectures, teaching rounds, basic science sessions, meetings, etc.						
IX. PROFESSIONAL READING	General medical reading, special reading to prepare for surgery, etc. (NOT research literature review)						
X. RESEARCH	All activities related to clinical or laboratory research projects, and the literature review for same.						
XI. CLERICAL WORK	Chart writing, discharge summaries, dictating letters, insurance forms, telephoning for patient appointments, completing miscellaneous forms, scheduling patients, etc.						
XII. TRAVEL	To and from work, between hospitals during day, etc.						
XIII. MILITARY DUTY	Reserve meetings, National Guard meetings, etc.						
XIV. OTHER EMPLOYMENT	All employment not part of formal residency program. See accompanying letter. Not Reported To Programs.						
XV. PERSONAL, SOCIAL AND RECREATIONAL	All activities not related to professional activities						
XVI. WASTED TIME	Enter description of what this constitutes on page 5.						
XVII. OTHER (Please specify on page 5)	Those activities which occupied $\frac{1}{2}$hour or more during any day, and which were necessitated by your work, but are not accurately described by any of the above.						

Col. No.

Examination Number ____________

1-8

American Academy of Orthopaedic Surgeons
1970 ORTHOPAEDIC IN-TRAINING EXAMINATION

RESIDENT EVALUATION FORM

9-18 RESIDENT'S NAME ____________________________

19 Year in Training ____________

Col. No.		Insufficient Information to Judge	RANKING Lower Quarter			Lower Middle Quarter			Upper Middle Quarter			Upper Quarter		
20-21	Factor 1: KNOWLEDGE OF CLINICAL ORTHOPAEDICS	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
22-23	Factor 2: KNOWLEDGE OF BASIC SCIENCES AS RELATED TO ORTHOPAEDICS	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
24-25	Factor 3: ABILITY TO GATHER CLINICAL INFORMATION	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
26-27	Factor 4: ABILITY TO USE INFORMATION TO SOLVE PROBLEMS	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
28-29	Factor 5: JUDGMENT IN DECIDING APPROPRIATE CARE AND TREATMENT	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
30-31	Factor 6: SKILL IN SURGICAL PROCEDURES	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
32-33	Factor 7: RELATING EFFECTIVELY TO PATIENTS	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
34-35	Factor 8: ACCEPTING RESPONSIBILITY FOR LONG-TERM-PATIENT CARE	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
36-37	Factor 9: ABILITY TO ACT EFFECTIVELY IN EMERGENCY SITUATIONS	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
38-39	Factor 10: RELATING EFFECTIVELY TO COLLEAGUES AND OTHER MEDICAL PERSONNEL	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
40-41	Factor 11: DEMONSTRATING THE MORAL AND ETHICAL STANDARDS REQUIRED OF A PHYSICIAN	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12
42-43	Factor 12: OVER-ALL COMPETENCE AS AN ORTHOPAEDIC SURGEON	☐ 00	☐ 01	☐ 02	☐ 03	☐ 04	☐ 05	☐ 06	☐ 07	☐ 08	☐ 09	☐ 10	☐ 11	☐ 12

It is understood that the information on this evaluation form and the results of the Orthopaedic In-Training Examination may be used for statistical and research purposes, that access thereto will be limited by the American Academy of Orthopaedic Surgeons, and that all data will be identified by code number only.

44-53 Signature ____________________________

ARBC QUESTIONNAIRE March 1971

Twenty-Three men have now taken their Board Examination under the Abreviated Residency Board Candidate Program. Both the Board and The Orthopaedic Training Study are interested in a number of factors associated with your part in the ARBC Program and your plans. We would very much appreciate your answering the following questions and return the form to us as soon as possible. Of course, this information will not be used in any fashion which would permit identification of individual respondents.

1. Please list the specific rotations (i.e. childrens, adult, trauma, etc.) completed at the time of the board exam.

Rotation Duration

____

____

____

____

2. What rotations did you complete after The Board Exam?

Rotation Duration

____

____

____

3. What type internship did you complete?

4. Military service

Completed ____________
Branch of Service ____________

Duty (G MO., Surgeon, etc.)
____

Not completed ____________
Branch of Service ____________

Plans for military service
____
When?______________________

5. What, if anything, did you do to prepare for the Boards? (Review JBJS, tests, instructional courses, etc.)

____

____

____

____

____

6. Did you attend any review course(s) prior to Boards?

7. If so, was this helpful to you in taking the Boards?

8. Which course(s) did you attend?

9. Were The Boards as difficult as expected?
more
less

10. What are your future practice plans?
A. Solo
B. Single specialty group
C. Multispecialty group
D. Other (please specify) ____________
E. Undecided

11. Do you plan to have a role in teaching residents in the future?
Yes ______
No ______

12. When would your scheduled residency have been completed?
____

13. Do you plan to complete your scheduled residency?
Yes ______
No ______

14. If no, what are your immediate plans for next year?

____

____

____

____

____

15. If yes, please order rank the four major reasons for continuing your scheduled residency from the following list. (Place the number 1 in front of the most important reason, etc.)

____1. My Chief recommended it.

____2. Insufficient time to plan an alternative

____3. Had not finished best rotation in residency

____4. Did not feel completely trained

____5. Needed time to set-up practice arrangements

____6. Military commitment

____7. Wanted special or fellowship training

____8. Personal plans interferred with learning

____9. Feeling of obligation of residency program

____10. Other reasons (Please specify).

16. Has being an early Board Candidate changed your career plans or choices in any way?

____

____

____

____

1. Please list the specific rotations (i.e. children, adult, truaum, etc.) completed at the time of the board exam.

Rotation	Duration

2. What type internship did you complete?

____

3. What, if anything, did you do to prepare for the boards?

____

____

4. Please list your professional activities since passing the board exam: ____

____

____

____

____

____

Thank you, please return to:

Carl J. Olson, Ed.D., Co-ordinator
University of Illinois
Center for Educational Development
901 South Wolcott Avenue
Chicago, Illinois 60612

ORTHOPAEDIC TRAINING STUDY

Resident Background Survey

AMERICAN BOARD OF ORTHOPAEDIC SURGERY
NRC-NAS SKELETAL SYSTEM COMMITTEE
CENTER FOR THE STUDY OF MEDICAL EDUCATION

RESIDENT BACKGROUND SURVEY

GENERAL INSTRUCTIONS

Your answers to the attached questions will help us identify differences among residents in terms of their background and attitudes. Most of the questions can be answered simply be checking (✓) the most appropriate response. If none of the responses listed seem appropirate, please select the closest approximation or check "Other" and write in your specific response in the space provided.

It is extremely important that you complete ALL of the identification items at the top of page one. This information will be used for research purposes only and will not be available on an individual basis to any staff member at your institution.

If you feel there are important areas not covered, please feel free to add your comments in the space provided at the end of this booklet.

Thank you for your cooperation.

prepared by

Center for the Study of Medical Education

University of Illinois

April, 1969

RESIDENT BACKGROUND SURVEY

Form: |1|2|
1 2

Program:______________________ |_|_|_|_|
3 4 5 6

Institution:______________________ |_|_|_|_|
7 8 9 10

City:______________________ State:______________________

AMA Number |__|__|__|__|__|__|__|__|__|__|
11 12 13 14 15 16 17 18 19 20

Social Security Number |__|__|__| - |__|__| - |__|__|__|__|
21 22 23 24 25 26 27 28 29

Year of Training Beyond Internship |__|
30

Name:______________________ Date: ___|___|___|
Last First Initial Mo. Day Yr.
31-32 33-34

Age: |__|__|
35 36

Sex: (1) Male |_| (2) Female |_|
37

DIRECTIONS

Please respond to each question or statement, as directed, by checking the appropriate response or by writing in a number to indicate the significance of a named factor. Thank you for your cooperation in this important study.

Col.

RESIDENT BACKGROUND SURVEY

38 1. Marital Status: (please check one)
____1) Single
____2) Engaged
____3) Married
____4) Divorced
____5) Widow or Widower
____6) Separated

39 2. If married, how many children do you have? ☐

40 3. Race: (please check one)
____1) Caucasian
____2) Negro
____3) Oriental
____4) Other (please specify)________________

41 4. Do you have any relatives who are physicians? ____1) Yes, ____2) No
If yes, please complete the following table:

Col.	Relationship	CSME Use Only		Medical Specialty
42-45	1	☐☐	☐☐	
46-49	2	☐☐	☐☐	
50-53	3	☐☐	☐☐	

54 5. Do you have relatives who are in health-related occupations? ____1) Yes, ____2) No
If yes, please complete the following table:

Col.	Relationship	CSME Use Only		Occupation (please be specific)
55-59	1	☐☐	☐☐☐	
60-64	2	☐☐	☐☐☐	
65-69	3	☐☐	☐☐☐	

70 6. In what area of the country did you live longest before going to medical school?
(please check one)
____1) New England
____2) Middle Atlantic
____3) Southeast
____4) Midwest
____5) Midsouth
____6) Great Plains
____7) Southwest
____8) Pacific Coast
____9) Other than U.S. (please specify)________________

71 7. Which of the following best describes the community which you think of as your hometown during your high school days? (please check one)
____1) Suburb in a metropolitan area of more than 2, 000, 000 population
____2) Suburb in a metropolitan area of 500, 000 to 2, 000, 000
____3) Suburb in a metropolitan area of 100, 000 to 500, 000
____4) In a city (not a suburb) of more than 2, 000, 000
____5) In a city (not a suburb) of 500, 000 to 2, 000, 000
____6) In a city of 50, 000 to 500, 000
____7) City or town of 10, 000 to 50, 000
____8) Town of less than 10, 000
____9) Farm, ranch or other open country

72-73 8. How far did your parents go in school? (please make one check for each parent)

Father	Mother	
____1)	____1)	Professional degree (master's, doctorate, etc.)
____2)	____2)	Four year college graduate
____3)	____3)	1-3 years of college
____4)	____4)	High School graduate
____5)	____5)	10-11 years of school (part of high school)
____6)	____6)	7-0 years of school
____7)	____7)	Under 7 years of school
____8)	____8)	Other (please specify)

Father ______________________________

Mother ______________________________

74 9. What is your estimate of the total income last year of your parental family (not your own family if you are married)? Consider gross income. (please check one)

____1) Under \$5, 000
____2) \$5, 000 - \$7, 500
____3) \$7, 500 - \$10. 000
____4) \$10, 000 - \$15, 000
____5) \$15, 000 - \$20, 000
____6) Over \$20, 000

75 10. How does your parental family's economic position now compare with what it was ten years ago? (please check one)

____1) Considerably higher now
____2) Somewhat higher now
____3) About the same
____4) Somewhat lower now
____5) Considerably lower now

76-77 11. Which of the following categories comes closest to your father's and mother's occupations? If your father or mother is retired, deceased, or unemployed, indicate their former or customary occupations. (please make one check for each parent)

(76) Father	(77) Mother	
____1)	____2)	Unskilled worker, laborer, farm worker
____2)	____2)	Semiskilled worker (e.g., machine operator)
____3)	____3)	Service worker (policeman, fireman, barber, housewife, military noncommissioned officer, etc.)
____4)	____4)	Skilled worker or craftsman (carpenter, electrician, plumber, etc.)
____5)	____5)	Salesman, bookkeeper, secretary, office worker, etc.
____6)	____6)	Owner, manager, partner of a small business, lower level government official, military commissioned officer
____7)	____7)	Profession requiring a bachelor's degree (engineer, elementary or secondary teacher, etc.)
____8)	____8)	Owner, high-level executive--large business or high-level government agency
____9)	____9)	Profession requiring an advanced college degree (doctor, lawyer, college professor, etc.)

78 12. Does (did) your father usually work (please check one)

____1) For himself
____2) For someone else
1 in 80 ____3) Equal partnership
____4) Other (please specify)______________________________

dup. 13. Please indicate the approximate size of your graduating class for each of the following:

1-30 1-34	High School	|__| |__| |__| |__|
35-38	College	|__| |__| |__| |__|
39-41	Medical School	|__| |__| |__|

136

42-44 14. To the best of your knowledge, where did you rank academically in high school, college, and medical school? (please check one for each)

High (42) School	(43) College	Medical (44) School	
____1)	____1)	____1)	Upper 2%
____2)	____2)	____2)	Upper 5%
____3)	____3)	____3)	Upper 15%
____4)	____4)	____4)	Upper Quarter
____5)	____5)	____5)	Upper Half
____6)	____6)	____6)	Lower Half
____7)	____7)	____7)	Lower Quarter
____8)	____8)	____8)	Not Known

45-47 15. To the best of your knowledge, what was your average grade in high school, college, and medical school? (please check one for each)

High (45) School	(46) College	Medical (47) School	
____1)	____1)	____1)	Straight A
____2)	____2)	____2)	A minus, B plus
____3)	____3)	____3)	B
____4)	____4)	____4)	B minus, C plus
____5)	____5)	____5)	C
____6)	____6)	____6)	C minus or below
____7)	____7)	____7)	Not Known

16. How much did you like each of the following kinds of courses during high school and college? Use the following code:

6 = Liked Very Much	3 = Disliked
5 = Liked	2 = Disliked Very Much
4 = Neutral	1 = Did Not Take

(please code each course for both)

	High School	College	
48-49	____1)	____1)	Humanities (art, music, literature, etc.)
50-51	____2)	____2)	Languages
52-53	____3)	____3)	Mathematics
54-55	____4)	____4)	Biological Sciences
56-57	____5)	____5)	Physical Sciences
58-59	____6)	____6)	Social Sciences

60-62 17. What was your undergraduate (Bacca laureate) college major? Please be as specific as possible.

|__| |__| |__| ____
60 61 62

63-64 18. At what age did you definitely decide to study medicine? |__|__|

65-66 19. At what age did you definitely decide to study orthopaedics? |__|__|

67 20. Have you ever seriously considered any other occupation or profession?

____1) Yes

____2) No

If yes, please indicate as specifically as possible what they were, in order of preference.

68-70 |__| |__| |__| ____

71-73 |__| |__| |__| ____

2 in 80

dup 1-30 21. Have you or any member of your immediate family ever had any serious illness or accident?

31 ____1) Yes
____2) No

If Yes, please complete the following table. In the last column, 1 = no interference, 2 = slight interference, 3 = moderate interference, and 4 = great interference with medical school performance.

		Relationship	CSME Use Only		Illness or Accident	Interference (circle one)
32-37	You		☐☐	☐☐☐		1 2 3 4
38-43	Relative		☐☐	☐☐☐		1 2 3 4
44-49	Relative		☐☐	☐☐☐		1 2 3 4
50-55	Relative		☐☐	☐☐☐		1 2 3 4

22. In the blank before each factor listed below, enter the code number indicating the importance of that factor in YOUR choice of medicine. Please use the following code in responding:

4 = Great Importance
3 = Moderate Importance
2 = Slight Importance
1 = No Importance

56 ____1) Books or articles about medicine
57 ____2) Curiosity about the workings of the body
58 ____3) Curiosity about oneself
59 ____4) Desire for independence
60 ____5) Experience with illness in family
61 ____6) Family tradition
62 ____7) Father's influence
63 ____8) Formal vocational guidance
64 ____9) Interest in people
65 ____10) Interest in science
66 ____11) Medical student friend or relative
67 ____12) Mother's influence
68 ____13) Personal experience with illness
69 ____14) Physician friend or relative
70 ____15) Prestige motive
71 ____16) Profit motive
72 ____17) Radio, TV, movies
73 ____18) Religious motivation
74 ____19) Service motive
75 ____20) Other (please specify)________________________

3 in 80

dup. 1-30

23. In the blank before each factor listed below, enter the code number indicating the importance of that factor in YOUR choice of medical school. Please use the following code in responding:

4 = Great Importance
3 = Moderate Importance
2 = Slight Importance
1 = No Importance

31 ____1) Advice of premedical advisor
32 ____2) Advice of parents
33 ____3) Advice of medical school alumni
34 ____4) Advice of hometown physician
35 ____5) General reputation of school
36 ____6) Convenient geographical location
37 ____7) Desire to work with particular person
38 ____8) Nature of laboratory and research facilities
39 ____9) Financial considerations (tuition, living expenses, etc.)
40 ____10) Offer of financial support
41 ____11) Other (please specify)

24. In the blank before each factor listed below, enter the code number indicating the importance of that factor in YOUR choice of orthopaedics as a career. Please use the following code in responding:

4 = Great Importance
3 = Moderate Importance
2 = Slight Importance
1 = No Importance

42 ____1) Curiosity about the workings of the body
43 ____2) Desire for independence
44 ____3) Experience with illness in the family
45 ____4) Family tradition
46 ____5) Father's influence
47 ____6) Interest in people
48 ____7) Interest in science
49 ____8) Experience during internship
50 ____9) Medical resident friend or relative
51 ____10) Mother's influence
52 ____11) Personal experience with illness
53 ____12) Orthopaedic friend or relative
54 ____13) Desire to do surgery
55 ____14) Prestige motive
56 ____15) Profit motive
57 ____16) Service motive
58 ____17) Ability to work with hands
59 ____18) Desire to work with particular person
60 ____19) Nature of clinical material
61 ____20) Nature of specialty itself
62 ____21) Other (please specify)____________________________________

25. In the blank before each factor listed below, enter the code number indicating the importance of that factor in YOUR choice of an orthopaedic residency program.
Please use the following code in responding:

4 = Great Importance
3 = Moderate Importance
2 = Slight Importance
1 = No Importance

63 ____1) Advice of classmates
64 ____2) Advice of parents
65 ____3) Advice of medical school alumni
66 ____4) Advice of hometown physician
67 ____5) General reputation of program
68 ____6) Convenient geographic location
69 ____7) Association or experience in medical school
70 ____8) Desire to work with particular person
71 ____9) Financial considerations (living expenses, etc.)
72 ____10) Offer of financial support
73 ____11) Other (please specify)________________________________

4 in
80

140

____ dup. 1-30 26. In the blank before each factor listed below, enter the code number indicating the importance of that factor in encouraging you to continue in the orthopaedic residency program. Please use the following code in responding:

4 = Great Importance
3 = Moderate Importance
2 = Slight Importance
1 = No Importance

31 ____1) Good medical preparation
32 ____2) Good general mental ability
33 ____3) Good scientific ability
34 ____4) Ability to do well on examinations
35 ____5) Ability to "bounce back" from discouragement and failure
36 ____6) Ability to withstand the "pressure" of residency program
37 ____7) Satisfaction with the residency program
38 ____8) Satisfaction with the teaching
39 ____9) Congeniality with the other residents
40 ____10) General sociability and happiness
41 ____11) Interest in medicine as a career
42 ____12) Personal interest in becoming an orthopaedist
43 ____13) Lack of attraction of other careers
44 ____14) Confidence in ability to be a successful orthopaedist
45 ____15) Confidence in ability to be a successful physician
46 ____16) Good study habits
47 ____17) Devotion of adequate time and effort to studies
48 ____18) Freedom from part-time jobs
49 ____19) Freedom from outside activities
50 ____20) Good housing situation
51 ____21) Adequate rest and relaxation
52 ____22) Good emotional stability
53 ____23) Good physical health
54 ____24) Freedom from family problems
55 ____25) Freedom from social or dating problems
56 ____26) Freedom from financial problems
57 ____27) No other career to fall back on
58 ____28) Contemporaries were in similar financial straits
59 ____29) Pride in finishing what is started
60 ____30) Opinions of parents and relatives
61 ____31) Opinions of spouse or date
62 ____32) Opinions of fellow residents
63 ____33) Opinion of staff
64 ____34) Opinions of administrative officers
65 ____35) Eligibility for military service
66 ____36) Need for orthopaedists
67 ____37) Realization that your place couldn't be filled by another resident
68 ____38) Respect for chief
69 ____39) Rewards and satisfaction to be gained after Board certification
70 ____40) Other (please specify)________________________________

71 27. Many applicants for orthopaedic residency are anxious about their chances for being appointed. How would you rate yourself, with respect to this anxiety, in comparison with other residency applicants you knew or know? (please check one)

____1) Much more anxious
____2) More anxious
____3) Average
____4) Less anxious
____5) Much less anxious

5 in

80

dup. 1-30 28. In the blank before each factor listed below, enter the code number indicating the importance of that factor as a cause of the anxiety indicated in 27 above.
Please use the following code in responding:

4 = Great Importance
3 = Moderate Importance
2 = Slight Importance
1 = No Importance

31 ____1) Anxiety of parents
32 ____2) Attitude of other applicants
33 ____3) Basic feeling of inferiority
34 ____4) Discouraging attitude of instructor(s)
35 ____5) Having a non-science major
36 ____6) Lack of participation in extracurricular activities
37 ____7) Low grades in science courses
38 ____8) No logical reason
39 ____9) Over-all low grade average
40 ____10) Reports from students in medical school
41 ____11) Reports that only a small proportion of applicants are accepted
42 ____12) Other (please specify)________________________________

43 29. When appointed, what order of choice was your present residency program?
____1) First
____2) Second
____3) Third
____4) Fourth
____5) Fifth or lower

44-48 30. How strong was your desire to become an orthopaedist at the times indicated below?

Strength of Desire	(44) Medical School	(45) Internship	(46) When Applying for Residency	(47) When Appointed to Residency	(48) Now
Very Strong	____5)	____5)	____5)	____5)	____5)
Strong	____4)	____4)	____4)	____4)	____4)
Moderate	____3)	____3)	____3)	____3)	____3)
Slight	____2)	____2)	____2)	____2)	____2)
None	____1)	____1)	____1)	____1)	____1)

49 31. How many hours per week (including weekends) do you devote to reading orthopaedic or medical literature?
____1) 10 hours or less
____2) 11-15 hours
____3) 16-20 hours
____4) 21-25 hours
____5) More than 25 hours

50 32. How many hours per week do you devote to part-time employment outside the residency program?
____1) None
____2) 1-5 hours
____3) 6-10 hours
____4) 11-15 hours
____5) 16-20 hours
____6) 21 or more hours

51 33. If you are employed part-time outside your residency appointment, please indicate the type of part-time employment. (please check one)
____1) Directly related to orthopaedics
____2) Directly related to medicine in general
____3) Indirectly related to medicine (e.g. lab technician, ambulance service, etc.)
____4) Not related to medicine

52-5 34. During the periods listed below, how many hours per week did or have you devoted to extra-curricular activities not related to medicine (such as athletics, publications, fraternities, clubs, etc.)? (please check one in each column)

(52) College	(53) Medical School	(54) During this year	Hours per week
____1)	____1)	____1)	None
____2)	____2)	____2)	1-5 hours
____3)	____3)	____3)	6-10 hours
____4)	____4)	____4)	11-15 hours
____5)	____5)	____5)	16-20 hours
____6)	____6)	____6)	21 or more hours

55-5 35. How difficult were college, medical school and residency compared to what you expected? (please check one in each column)

(55) College	(56) Medical School	(57) Residency	
____5)	____5)	____5)	Much harder than expected
____4)	____4)	____4)	Somewhat harder than expected
____3)	____3)	____3)	About the same as expected
____2)	____2)	____2)	Somewhat easier than expected
____1)	____1)	____1)	Much easier than expected

58-6 36. How much competitiveness have you found among classmates in college, medical school and residency? (please check one in each column)

(58) College	(59) Medical School	(60) Residency	
____4)	____4)	____4)	A great amount
____3)	____3)	____3)	A moderate amount
____2)	____2)	____2)	A slight amount
____1)	____1)	____1)	None

61-6 37. In general, how would you describe your relationship with each of the following groups in your residency program? (please check one in each row)

		Very Pleasant	Pleasant	Neutral	Unpleasant	Very Unpleasant	None
61	Administrators	____6)	____5)	____4)	____3)	____2)	____1)
62	Attendings	____6)	____5)	____4)	____3)	____2)	____1)
63	Other Orthopaedic Residents	____6)	____5)	____4)	____3)	____2)	____1)
64	All Other Residents	____6)	____5)	____4)	____3)	____2)	____1)
65	Interns	____6)	____5)	____4)	____3)	____2)	____1)
66	Nurses	____6)	____5)	____4)	____3)	____2)	____1)
67	Other Hospital Personnel	____6)	____5)	____4)	____3)	____2)	____1)
68	Patients	____6)	____5)	____4)	____3)	____2)	____1)
69	Other significant people, namely ____________	____6)	____5)	____4)	____3)	____2)	____1)

6 in
80

dup. 1-30

38. In the blank before each of the following factors, enter the code number that indicates your general feeling about that aspect of your residency program.

5 = Very Satisfactory
4 = Satisfactory
3 = Neutral
2 = Unsatisfactory
1 = Very Unsatisfactory

31 ____1) Academic enthusiasm
32 ____2) Administrative policies
33 ____3 Breadth of interest of residents
34 ____4) Clinics
35 ____5) Counseling services
36 ____6) Curriculum or program outline
37 ____7) Attending-resident relationships
38 ____8) Financial aid
39 ____9) Food services
40 ____10) General reputation
41 ____11) Grading and/or rating of resident performance
42 ____12) Hospitals
43 ____13) Initial orientation program
44 ____14) Variety of case material
45 ____15) Laboratories
46 ____16) Lecture rooms
47 ____17) Library
48 ____18) Psychiatric service
49 ____19) Recreational service
50 ____20) Religious resources
51 ____21) Resident housing (on site)
52 ____22) Resident morale
53 ____23) Resident motivation from external pressures
54 ____24) Resident motivation from within self
55 ____25) Resident organizations and activities
56 ____26) Opportunities for surgical experience
57 ____27) Amount of case material
58 ____28) Salary
59 ____29) Responsibility for patients
60 ____30) Resident and Family housing arrangements
61 ____31) Transportation facilities
62 ____32) Other (please specify)________________________________

63-77 39. In the blank before each of the following factors, enter the code number that indicates the degree to which that factor has interfered with your residency training.

1 = No Interference (or no problem exists)
2 = Minor Interference
3 = Major Interference

63 ____1) Health of parents
64 ____2) Dependence on parents
65 ____3) Parental dependence on you
66 ____4) Discord between parents
67 ____5) Relations with other residents
68 ____6) Relations with attendings
69 ____7) Health
70 ____8) Insecurity concerning professional future
71 ____9) Separation from intended spouse
72 ____10) Children
73 ____11) Marital adjustment problems
74 ____12) Necessity to postpone having children
75 ____13) Health of spouse
76 ____14) Discrimination due to race, class status or ethnic group
77 ____15) Other (please specify)________________________________

78 40. What are your present education debts? (please check one)
____1) None
____2) Less than $1,000
____3) $1,000 - $2,999
7 in ____4) $3,000 - $4,999
80 ____5) $5,000 - $9,999
dup. ____6) $10,000 or more

1-30 41. What has your income been during residency? Consider gross income, including wife's salary
31-34 if working. (please check one in each column))

(31) 1st Year	(32) 2nd Year	(33) 3rd Year	(34) 4th Year	
____1)	____1)	____1)	____1)	Less than $4,000
____2)	____2)	____2)	____2)	$4,000 to $5,999
____3)	____3)	____3)	____3)	$6,000 to $7,999
____4)	____4)	____4)	____4)	$8,000 to $9,999
____5)	____5)	____5)	____5)	$10,000 or more

35 42. What type of career do you intend to follow?
____1) Full-time university
____2) Other full-time, non-academic
____3) Private practice, university affiliated program
____4) Private practice, non-university affiliated program
____5) Private practice, combined with some university affiliated work
____6) Private practice, some non-university affiliated work
____7) Private practice, no teaching plans
____8) Undecided

36 43. If you intend to enter private practice, which of the following would you prefer? (please check one)
____1) Solo practice
____2) Small clinic orthopaedics
____3) Small clinic mixed
____4) Large clinic orthopaedics
____5) Large clinic mixed
____6) Undecided

37-39 44. What do you anticipate that your gross income will be after your residency is completed? Please check one in each column)

(37)	(38) In Practice	(39)	
1 Year after	2 Years after	5 Years after	
____1)	____1)	____1)	$15, 000 - $20, 000
____2)	____2)	____2)	$20, 000 - $25, 000
____3)	____3)	____3)	$25, 000 - $30, 000
____4)	____4)	____4)	$30, 000 - $35, 000
____5)	____5)	____5)	$35, 000 - $40, 000
____6)	____6)	____6)	$40, 000 - $45, 000
____7)	____7)	____7)	$45, 000 - $50, 000
____8)	____8)	____8)	More than $50, 000

40 45. Does your wife work? (please check one)

____1) Not married (If this response is checked, please omit number 46.)
____2) Married, wife does not work
____3) Less than 10 hours per week
____4) 11-20 hours per week
____5) More than 20 hours per week

41-42 46. How long have you been married? |___|___|
Approximately what per cent of this time has your wife worked either full or part-time? (please check one)

43
____1) 0-20%
____2) 21-40%
____3) 41-60%
____4) 61-80%
____5) 81-100%

in 80

Please complete within two weeks of receipt. Seal in the attached envelope and deliver to your chief for return to:

Carl Olson, Ed. D
Office of Research in Medical Education
University of Illinois at the Medical Center
901 South Wolcott
Chicago, Illinois 60612

Thank you for your cooperation.

Additional Comments

SPECIAL REPORTS

III. Special Reports

A. Chiefs' Report - 1970

B. Essential Components of Orthopaedic Competency - Part I and II (The Essential Components of the Graduating Orthopaedic Resident's Capability)

C. Flexibility Proposal

D. Staff Development

E. Radiology Teaching Unit

Much of the initial data and preliminary findings are presented in the Chiefs' Report (III A.)

Training Chiefs Report

1969

PREPARED BY

CENTER FOR THE STUDY OF MEDICAL EDUCATION
OFFICE OF RESEARCH IN MEDICAL EDUCATION
UNIVERSITY OF ILLINOIS

Index of Reports
October 1969

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INTRODUCTION

The first step in the analysis of the data collected in the Orthopaedic Training Study was to summarize individual responses and describe group patterns (averages and/or percents). In this way we can examine responses of all respondents or individual training programs to questions like "When did you first learn to perform an anterior cervical fusion and how many times have you done it?"

Upon observing differences in and between groups in characteristics measured by the OTS instruments we began to hypothesize relationships between these characteristics and one or more performance scores on the In-Training Exam. See Table 1 for a list of the scores provided in the In-Training Exam. Statistical tests can be applied to determine if there is any relationship as hypothesized. One might guess, for example, that programs with a large number of institutions connected with it would perform better than programs which function entirely within one institution. To test this hypotheses we divided all programs into 3 groups as follows: 1 institution, 2, 3, 4, or 5 institutions, and 6 or more institutions. The analysis of variance used the In-Training Exam's total multiple choice score as the dependent variable. This test indicated that there was a significant difference in programs based on a classification by number of institutions. This test was significant beyond the .01 level (with an F of 7.11 and 2 and 704 df.) Means and standard deviations are tabled below.

# of Institutions	Mean	Standard Deviation
1	113.50	24.36
2-5	113.70	21.85
>5	134.74	21.96

Any characteristic of a program, an institution, the institutions of a program, the residents of a program, or the attendings of a program can be related to any performance for which a score is provided on the In-Training Exam. (See table 2)

During the advisory committee telephone conference it was suggested that the committee be sent a list of the kinds of relationships that we were planning to examine in the next step of the study. The foregoing examples and the following list of relationships is provided both for your comment and as a "springboard" for additional suggestions.

TABLE 1

IN-TRAINING EXAMINATION DATA

Multiple Choice Scores

General Orthopaedics
Adult Orthopaedics
Children's Orthopaedics
Trauma
Anatomy
Physiology-Biochemistry
Pathology
Bio-Mechanics
Rehabilitation
Hand Surgery
Recall (All items classified as recall)
Interpretation (All items classified as Interpretation)
Problem Solving (All items classified as problem solving)
Total (All items)

Patient Management Problem Scores (PMP)

Diagnostic Section positive score
Diagnostic Section negative score
Diagnostic Section net score
Treatment Section positive score
Treatment Section negative score
Treatment Section net score
Total Problem positive score
Total Problem negative score
Total Problem net score

-PMP scores above are available for individual problems (cases) and for the total test (all problems taken together.)
-PMP positive scores are definitely indicated choices made
-PMP negative scores are definitely contraindicated choices ma
-PMP net scores are the positive minus the negative scores

TABLE 2

Independent Variable	Dependent Variable
# Institutions in a program	M/C Score
Program Organization Univ. Indep.	M/C Score & PMP Score
# of Attending Staff	" " " "
# full time attending	" " " "
Number of Residents	" " " "
Program Length	" " " "
Existence of a follow-up clinic	" " " "
# of orthopaedic subspecialists	" " " "
Each ortho subspecialists	Subspecialty M/C Scores
Extent of Res. Teaching activities	M/C Score

The O.T.S. Experimental and Control Group Samples and the Population Compared on 20 O.I.T.E. Scores

In Phase II of the Orthopaedic training study two groups of residency training programs were selected from all U.S. programs. Group 1, which consisted of 280 residents from 16 programs, was titled "experimental" since later in the study innovations would be introduced in their programs and their effects assessed. Group 2, consisted of 504 residents from 25 programs and was titled "control" since no changes were to be made in these programs.

One of the first procedures in evaluating these groups was to determine if 1) both the experimental and control groups could be considered to be representative of the population of programs; i.e., a random sample from the population, and 2) the experimental and control groups are comparable samples. Since population values of X and s, i.e., μ and σ were available, the procedure was straight forward. A 99% confidence interval was constructed around the population mean employing the standard error of the mean (a function of sample size). A confidence interval is a set of bounderies constructed above and below the population mean. It is a function of the size of samples to be drawn from the population, and the deviation of the population of measures from the population mean (Standard deviation of the population). 99% of all sample means should fall within this interval if they are random samples from this population.

The formulation of the procedure is as follows:

N = Sample Size

μ = Population Mean

σ = Population Standard Deviation

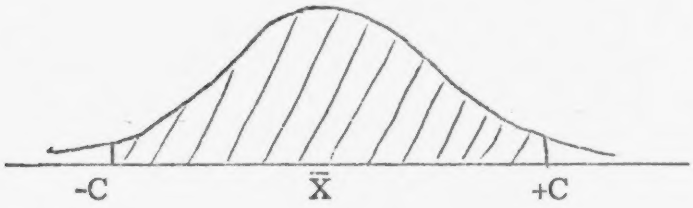
$\bar{X}$ = Sample Mean

2.58 = Z score with .005 in each tail of the normal distribution

$\frac{\sigma}{\sqrt{N}}$ = Standard error of population mean

99% confidence $(\pm C) = \bar{X} \pm \frac{\sigma}{\sqrt{N}} 2.58$
interval

We have constructed a sampling distribution of means with a 99% confidence interval. This can be represented graphically as follows:



If a particular sample mean falls within the shaded area we can state that the sample of programs is a random sample from the population of programs. If a particular sample mean falls outside the shaded area on either tail of the distribution we can state with 99% confidence that this sample of programs is NOT a random sample from the population of programs.

Comparison of the type described were performed for 20 of the scores on the 1968 Orthopaedic In-Training Examination. (See table 1)

Two of the scores listed are summary scores of each of the two sections of the examination: Multiple Choice and Patient Management Problems. These scores provide the best overall comparison of the groups. The other scores listed are multiple choice sub-scores, PMP sub-scores, and what are called derived scores namely; recall, interpretation, and problem solving. These derived scores are given for both the multiple choice and PMP parts of the exam. The column labeled discrepancy refers to the difference between the sample mean and the upper limit of the population distribution.

RESULTS

EXPERIMENTAL GROUP VS. POPULATION (Table 1)

We can be 99% confidence that the experimental group is not a random sample from the population of programs on the overall exam scores. The strongest evidence of non-randomness of the experimental sample is found on the multiple choice section of the exam. The total multiple choice score, 9 of the 10 multiple choice sub-scores, and the recall and interpretation derived scores indicate that the experimental group is not a random sample from the population of programs. In considering the derived scores, we find that the experimental group can be considered to be a random sample when considering multiple choice problem solving items, and those portions of the PMP section of the exam which deal with treatment, recall, interpretation, and problem solving, and the multiple choice problem solving score.

One hypothesis would be that the experimental group is better than the population of programs on those types of examination questions which deal with recall or interpretation of factual material. The two groups are similar when considering complex learning outcomes as tested in the PMP problems in general, and in multiple choice problem solving items.

CONTROL GROUP VS. POPULATION (Table 2)

The same method, employing a confident interval about the population mean, was applied to this comparison. For all variables, the control group mean fell within the confidence interval constructed about the population mean. Therefore, the control group can be considered to be a random sample of programs from the population of programs.

EXPERIMENTAL GROUP VS. CONTROL GROUP (Table 3)

This comparison was performed by a t-test for groups with unequal n's. The T-value which indicates significance at the .01 level is 2.576. If these groups differ significantly, changes in performance of the experimental group as the result of innovations introduced cannot be directly assessed; but would have to be modified in terms of initial performance. It was found that in the Total Multiple Choice score, 6 of the 10 multiple choice subscores and the Recall and Interpretation derived scores the experimental group had significantly higher scores when compared to those of the control group. Therefore, some accommodation must be made for these initial differences in performance when assessing changes in experimental programs due to innovations.

SUMMARY AND CONCLUSIONS

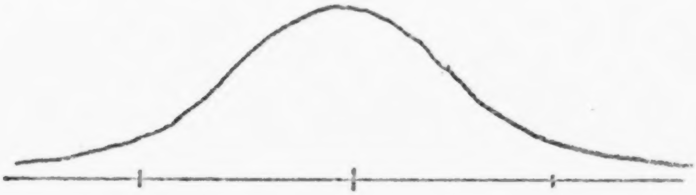
Let us first review the findings:

Experimental Sample vs. Population - significant difference in 14 of 20 scores
Control Sample vs. Population - no differences found
Experimental Sample vs. Control Sample - significant differences in 9 of 20 Scores (all M/C scores)

The results of this study indicate that accommodation or correction must be made when comparing the performance of residents from the experimental sample of programs on recall of factual information or interpretation of data type scores to the performance of either the control group or the population of programs. Indications for further study include an investigation of residents from the groups of programs in this study at different stages in their orthopaedic training to determine when this observed overall difference in the store of factual orthopaedic knowledge between two groups began.

TABLE 1

Experimental - Population Comparison

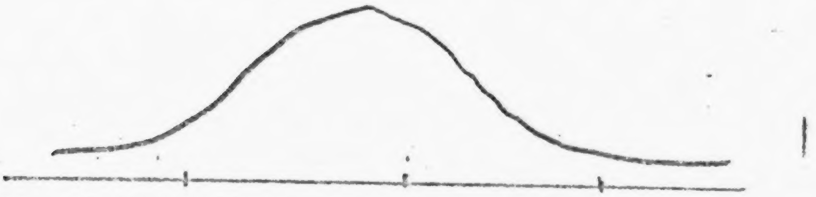


Variable	Lower Limit	Population Mean	Upper Limit	Sample Mean	Discrepancy
Total M/C	126.116	129.448	132.779	137.985	5.206**
M/C Gen. Ortho	29.541	30.490	31:438	33.117	1.679**
M/C Adult	46.469	47.646	48.823	50.657	1.834**
M/C Child	36.163	37.426	38.688	39.460	.772**
M/C Trauma	13.353	13.868	14.382	14.750	.368**
M/C Anatomy	22.967	23.831	24.696	24.700	.004**
M/C Physio-Biochem.	23.568	24.245	24.922	26.057	1.135**
M/C Pathology	40.846	42.135	43.424	45.660	2.236**
M/C Bio Mechanics	8.044	8.419	8.793	8.978	.185**
M/C Hand Surgery	9.393	9.857	10.321	11.082	.761**
M/C Rehabilitation	6.234	6.510	6.786	6.696	——
M/C Recall	102.959	105.733	108.507	112.600	4.093**
M/C Interpretation	15.268	15.892	16.516	17.275	.759**
M/C Prob. Solving	7.564	7.855	8.146	8.110	——
PMP Total	83.763	86.906	90.048	90.128	.080**
PMP Diagnostic	28.824	29.934	31.044	31.157	.113**
PMP Treatment	54.406	57.044	59.681	59.082	——
PMP Recall	15.542	16.200	16.859	16.671	——
PMP Interpretation	13.178	13.814	14.449	14.375	——
PMP Prob. Solving	46.257	48.308	50.360	49.664	——

** $p < .01$

TABLE 2

Control - Population Comparison



Variable	Lower Limit	Population Mean	Upper Limit	Sample Mean	Discrepancy
Total M/C	126.116	129.448	132.779	130.648	
M/C Gen. Ortho	29.541	30.490	31.438	30.593	
M/C Adult	46.469	47.646	48.823	48.065	
M/C Child	36.163	37.426	38.688	38.035	
M/C Trauma	13.353	13.868	14.382	13.954	
M/C Anatomy	22.967	23.831	24.696	24.188	
M/C Physio-Biochem.	23.568	24.245	24.922	24.341	
M/C Pathology	40.846	42.135	43.424	42.404	
M/C Bio Mechanics	8.044	8.419	8.793	8.666	
M/C Hand Surgery	9.393	9.857	10.321	9.750	
M/C Rehabilitation	6.234	6.510	6.786	6.759	
M/C Recall	102.959	105.733	108.507	106.980	
M/C Interpretation	15.268	15.892	16.516	15.686	
M/C Prob. Solving	7.564	7.855	8.146	7.982	
PMP Total	83.763	86.906	90.048	88.297	
PMP Diagnostic	28.824	29.934	31.044	30.401	
PMP Treatment	54.406	57.044	59.681	57.895	
PMP Recall	15.542	16.200	16.859	16.528	
PMP Interpretation	13.178	13.814	14.449	13.995	
PMP Prob. Solving	46.257	48.308	50.360	49.275	

** $p < .01$

TABLE 3

Experimental-Control Comparison

Variable	T-Value
Total M/C	4.340**
M/C General Ortho.	5.414**
M/C Adult Ortho.	4.529**
M/C Childrens Ortho.	2.146
M/C Trauma	3.001*
M/C Anatomy	1.148
M/C Physio-Biochem.	5.299**
M/C Pathology	5.103**
M/C Bio Mechanics	1.629
M/C Hand Surgery	5.644**
M/C Rehabilitation	.448
M/C Recall	4.013**
M/C Interpretation	4.988**
M/C Problem Solving	.889
PMP Total	1.218
PMP Diagnostic	1.469
PMP Treatment	.909
PMP Recall	.468
PMP Interpretation	1.222
PMP Problem Solving	.387

*p < .05
**p < .01

TABLE 4

Group Means and Standard Deviation

Variable	MEANS			STANDARD DEVIATIONS		
	Pop.	Exp.	Ctl.	Pop.	Exp.	Ctl.
Total M/C	129.4	138.0	130.6	22.22	23.68	21.03
M/C Gen. Ortho.	30.5	33.1	30.6	6.33	6.48	5.99
M/C Adult	47.6	50.7	48.1	7.85	7.75	7.67
M/C Child	37.4	39.5	38.0	8.42	9.19	8.37
M/C Trauma	13.9	14.8	14.0	3.43	3.79	3.08
M/C Anatomy	23.8	24.7	24.2	5.77	6.02	5.94
M/C Physio-Biochem.	24.2	26.1	24.3	4.52	4.40	4.29
M/C Pathology	42.1	45.7	42.4	8.60	8.86	8.09
M/C Bio Mechanics	8.4	9.0	8.7	2.50	2.66	2.41
M/C Hand Surgery	9.9	11.1	9.8	3.10	3.27	2.98
M/C Rehabilitation	6.5	6.7	6.8	1.84	1.96	1.80
M/C Recall	105.7	112.6	107.0	18.50	19.58	17.48
M/C Interpretation	15.9	17.3	15.7	4.16	4.47	3.93
M/C Prob. Solving	7.9	8.1	8.0	1.94	1.97	1.88
PMP Total	86.9	90.1	88.3	20.95	20.08	20.41
PMP Diagnostic	29.9	31.2	30.4	7.40	6.89	6.89
PMP Treatment	57.0	59.1	57.9	17.59	17.24	17.95
PMP Recall	16.2	16.7	16.5	4.39	4.10	4.08
PMP Interpretation	13.8	14.4	14.0	4.24	4.27	3.95
PMP Prob. Solving	48.3	49.7	49.3	13.68	13.32	13.76

Orthopaedic Training Study
Experimental and Control Group

First Year Residents Comparison

The purpose of this study was to determine if differences in general orthopaedic knowledge existed between residents from 2 samples of orthopaedic residency training programs prior to residency training. The first year OITE was selected because it was the only indication of orthopaedic achievement available. The short period of residency completed prior to the first year OITE (about 4 months) was not assumed to be a significant factor in determining test scores.

The experimental hypothesis was that there were no differences between first year residents in the experimental group and first year residents in the control group on any of the scores of the Orthopaedic In-Training Examination. The method of analysis employed was a T-test for independent unequal sized groups. There were 50 first year residents from the 16 experimental group programs and 84 first year residents from the 34 control group programs.

No significant differences were found for any of the 20 scores tested. Any differences in OITE scores found between these two groups during or after training may be said to be due to something other than a difference in entering knowledge.

TABLE I

T-Test Summary Table
For The Experimental And Control Groups
First Year Resident's Comparison

Variable	T-Score
Total M/C	-2.061
M/C General Ortho.	-1.832
Adult Ortho.	-2.249
Children's Ortho.	-1.641
Trauma	.343
Anatomy	-1.172
Physio-Biochemistry	-2.081
Pathology	-1.990
Bio-Mechanics	-1.429
Hand Surgery	-.879
Rehabilitation	.338
M/C Recall	-1.986
Interpretation	-1.820
Problem Solving	.187
PMP Total	-.154
Diagnostic	.946
Treatment	-.703
Recall	.738
Interpretation	1.642
Problem Solving	-.757

$p > .01 = T > 2.58$

Nineteen Characteristics of Orthopaedic Training Programs related to Total Multiple Choice Score on the O.I.T.E.

The nineteen program characteristics listed in table 1 were hypothesized to be related to resident's performance as measured by the O.I.T.E. The sample consisted of 706 residents from the 47 residency programs of the Orthopaedic Training Study. The method of analysis was a one-way analysis of variance classifying a program, and therefore all the residents from that program, into one of the factor levels. The results are displayed in a series of tables following this page.

The analysis title is given with an accompanying table which contains the following information. First, Program grouping which refers to the categories into which programs were classified for the particular analysis. These categories are mutually exclusive and exhaustive of the responses given on the program questionnaires. Second, the number of programs from the study classified into each program grouping. Third and fourth, the program grouping mean and standard deviation are displayed. The last column refers to the overall ANOVA F- value for that analysis. No post-hoc analyses were made yet since trends and differences are fairly obvious. They will be made where needed to refine the results. A table of significant F values is provided for your convenience.

No. of Levels (N)	Significant F for N-1 and 705 df. .01 level	Significant F for N-1 and 705 df. .05 level
2	6.66	3.85
3	4.62	3.00
4	3.80	2.61
5	3.34	2.38

Results

Each of the significant results will now be presented.

Number of Institutions

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
1 institution	(3)	113.5	24.4	
2-5 institutions	(32)	133.7	21.9	7.11**
6 or more institutions	(12)	134.7	22.0	

Program Organization

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
Independent	(8)	126.5	22.3	
Affiliated with University	(5)	132.5	22.8	6.94**
University	(34)	135.1	21.8	

Chief's Control

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
Direct control over all facets of program	(21)	130.8	20.5	5.50*
Parts of control delegated to chief's of program parts	(26)	135.0	22.8	

Chief's Availability (location of major office)

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
In principal program institution (PPI)	(30)	135.7	21.7	
Immediately adjacent to PPI	(7)	126.1	20.3	6.79**
Less than one mile from PPI	(6)	130.8	24.4	
More than one mile from PPI	(4)	124.2	21.0	

Number of Attending Staff

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
1 to 8 attendings	(11)	128.3	23.0	
9 to 16 attendings	(12)	133.2	20.4	4.87**
17 or more attendings	(24)	135.4	22.4	

Number of Residents

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
1-8 residents	(12)	124.8	24.4	
9-16 residents	(14)	129.8	21.7	12.87**
17-24 residents	(14)	140.1	19.9	
25 or more residents	(7)	133.3	22.2	

Number of Foreign Graduates

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
None	(19)	136.6	22.3	
1-4 foreign grads	(22)	129.8	22.1	7.29**
5 or more foreign grads	(5)	135.1	20.9	

Program Design

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
Complete Ortho as standardly defined	(18)	129.4	23.1	
Complete plus opportunity for specialized interests	(25)	135.2	21.5	4.73**
Partial Ortho plus training in other locations	(4)	134.7	22.7	

Clinical Material Balance - (% of private & % of staff patients)

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
0-20% private 81-100% staff	(8)	129.8	22.3	
21-40% private 61-80% staff	(13)	137.6	21.5	
41-60% private 41-60% staff	(14)	135.8	21.6	7.61**
61-80% private 21-40% staff	(6)	124.7	23.3	
81-100% private 0-20% staff	(6)	135.2	19.1	

Number of Ortho. Outpatient Clinics

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
3 or 4 clinics	(10)	131.1	22.8	
5 or 6 clinics	(20)	132.1	21.5	3.72*
7 or 8 clinics	(16)	136.5	22.5	

Number of Orthopaedic Subspecialists

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
0-2 subspecialists	(7)	128.3	21.2	
3-5 subspecialists	(26)	132.6	21.9	5.27**
6-8 subspecialists	(13)	137.3	22.9	

Resident Teaching Activities

Residents required to instruct

1) other residents
2) interns
3) medical students
4) allied health professionals
5) others

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
0 to 2 of the above 5	(8)	125.5	23.9	
3 of the above 5	(17)	133.6	22.3	9.78**
4 or 5 of the above 5	(22)	136.1	21.0	

Resident Supervision in surgery

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
in all cases regardless of complexity	(29)	130.1	21.8	10.27**
in accordance with the needs of the resident	(18)	135.6	22.1	

Number of Residents Dismissed in past five years

Program Grouping	# of Programs	Group Mean	Standard Deviation	F
None	(23)	130.5	22.2	10.46**
1 or more	(23)	136.0	22.1	

Table I

The 19 Variables studied in this analysis
Number of Institutions
Program Organization
Chief's Control
Chief's Availability
Chief's Income from Salary
Number of Attending Staff
Number of Full-Time Attendings
Number of Residents
Program Length
Number of Foreign Graduates
Program Design re: Completeness
Clinical Material Balance
Number of Ortho. Outpatient Clinics
Follow-up Clinic
Number of Ortho. Subspecialists
Basic Science Instruction Format
Number of Resident Teaching Activities
Resident Supervision in Surgery
Number of Residents Dismissed

ABBREVIATED RESIDENCY BOARD APPLICANTS OF JANUARY 1970 COMPARED TO THEIR PEERS ON 1968 AND 1969 OITE EXAMINATION SCORES

In accordance with the goals of the Orthopaedic Training Study eleven orthopaedic residents took the 1970 Orthopaedic Certification Exam at a time which was prior to the completion of the previously required time for the residency program that they were appointed to. The decision to take the exam early was made jointly by the resident and the chief of his training program. At the time of the certification exam three of these eleven were finishing their third year of orthopaedic training and eight were finishing their fourth year of training.

The purpose of this study was to compare the performance of these eleven residents to others on OITE scores for the 1968 and 1969 exams. The exams were given as follows:

1968 OITE Nov 1968
1969 OITE Nov 1969
1970 OCE Jan 1970

The results show that the mean score of the ARBC is always above that of their peers and the mean of the fourth year residents group. In most cases nine of the eleven ARBCs had scores higher than the fourth year residents mean. They are above the 86% of their peers and better than the average fourth year resident.

No tests of significance have been performed to date but a significant result would surely be expected. A further investigation into backgrounds, attitudes, confidence, and their lives since the Board exam is also planned.

A Comparison of Percent Scores of Abbreviated Residency Board Candidates with Their Peers and 4th Year Residents 1968 O.I.T.E. Scores

Abbreviated Residency Board Candidates were 3rdyear residents at the time of the '68 O.I.T.E.

		ARBC	Peers	4th yr. Res.
M/C Total	$\bar{X}$	66.6	55.8	60.2
	sd	4.2	7.9	8.0
Genl. Ortho	$\bar{X}$	69.5	58.3	62.6
	sd	7.7	10.9	10.5
Adult Ortho	$\bar{X}$	67.8	57.6	61.1
	sd	8.4	8.2	8.5
Children-Ortho	$\bar{X}$	65.7	54.6	60.1
	sd	6.1	9.9	9.7
Trauma	$\bar{X}$	60.5	49.0	53.5
	sd	10.0	11.3	11.9
Hand Surg.	$\bar{X}$	59.1	45.1	49.8
	sd	23.4	12.9	12.9
Anatomy	$\bar{X}$	61.3	54.5	59.7
	sd	8.1	10.5	10.3
Pathology	$\bar{X}$	71.2	56.8	61.4
	sd	4.2	9.9	9.6
Physio-Biochem.	$\bar{X}$	62.7	55.5	57.9
	sd	10.2	10.1	10.2
Bio-Mechanics	$\bar{X}$	68.9	54.7	61.3
	sd	11.6	13.8	13.4
Rehabilitation	$\bar{X}$	58.5	56.3	60.6
	sd	9.8	14.5	14.1

		ARBC	Peers	4th yr. Res.
Recall	$\overline{X}$	67.5	56.5	61.2
	sd	5.1	8.3	8.3
Interpretation	$\overline{X}$	65.1	51.8	56.2
	sd	11.7	11.6	11.4
Prob. Solving	$\overline{X}$	59.9	54.3	56.2
	sd	12.3	12.1	12.5

A Comparison of Percent Scores of Abbreviated Residency Board Candidates with Their Peers and 4th Year Residents 1969 O.I.T.E. Scores

Abbreviated Residency Board Candidates were 4th year residents at the time of the '69 O.I.T.E.

		ARBC	Peers	4th yr. Res.
M/C Total	$\bar{X}$	69.8		61.8
	sd	2.7		7.6
General Ortho	$\bar{X}$	68.4		56.6
	sd	6.5		10.4
Adult Ortho	$\bar{X}$	70.0		61.0
	sd	5.6		8.4
Childrens Ortho	$\bar{X}$	76.7		67.1
	sd	5.6		10.6
Trauma	$\bar{X}$	67.0		62.2
	sd	3.5		9.2
Hand	$\bar{X}$	69.5		62.8
	sd	5.7		11.1
Anatomy	$\bar{X}$	79.7		67.8
	sd	5.6		11.3
Pathology	$\bar{X}$	69.4		59.4
	sd	4.1		8.9
Physio-Biochem.	$\bar{X}$	65.6		56.1
	sd	9.5		11.6
Bio-Mechanics	$\bar{X}$	57.4		52.1
	sd	11.7		13.3
Rehabilitation	$\bar{X}$	52.7		51.6
	sd	11.7		14.3
Recall	$\bar{X}$	70.0		62.0
	sd	4.3		8.2
Interpretation	$\bar{X}$	68.7		59.8
	sd	6.0		11.1
Problem Solving	$\bar{X}$	69.2		59.7
	sd	7.4		17.0

Subspecialist on staff VS. Resident's subspecialty M/C Subscore

The purpose of this study was to determine if a relationship exists between the presence of an orthopaedic subspecialist on the residency program's regular teaching staff and the mean of the multiple choice subscore dealing with that subspecialty on the In-Training Exam. The following subspecialties were examined: pediatrics, pathology, biomechanics, hand, rehabilitation. Forty seven programs from the orthopaedic training study were included in this study. Table 1 displays the mean score and number of programs, in parentheses, in each group. It also presents the Z-score for each of the five areas a Z-score of 2.58 was needed for significance at the .01 level.

The presence of a subspecialist in the five areas listed above does not significantly increase the residents scores in those subspecialties. In fact for three of the five subscores the residents programs without such a subspecialist scored better in the M/C Subscore dealing with that subspecialty than residents from programs which have such a subspecialist.

Further investigation of these results is certainly indicated. What type of training do residents from programs without a particular subspecialist receive in the particular subspecialty? Do they have a course or a series of lectures about the subspecialty? Do they just suggest readings? How are subspecialists utilized when they _are_ part of the residency program?

Table 1.

A comparison of residents subspecialty scores on the 1968 OITE and the presence or absence of a subspecialist on the staff of the residency program.

Subspecialty	No Subspecialist Mean	(N)	Subspecialist Mean	(N)	Z Score
Pediatrics	38.05	(12)	38.54	(35)	.40
Pathology	39.19	(16)	41.04	(31)	1.87
Bio-Mechanics	34.14	(31)	30.30	(16)	1.37
Hand	29.77	(7)	25.27	(40)	.12
Rehabilitation	23.87	(17)	21.57	(30)	.70

$p < .01 = Z > 2.58$

RESIDENT'S EXPERIENCE WITH 58 SELECTED PROCEDURES DIVIDED BY YEARS OF TRAINING

The Resident Procedures Form contains a list of 58 procedures as shown in table 1. The residents responded to the following five questions relating to each procedure: 1) When did you first learn this procedure? 2) How many times have you performed it? 3) How well can you perform it? 4) Who first taught you? and 5) If self-taught what method(s) did you use? The returns include 93 first year residents, 164 second year residents, 143 third year residents and 192 fourth and fifth year residents (combined). The total group, then, is 592 residents. The results are reported in two forms. Tables 2 through 6 show summaries of the data of particular interest. The appendix which follows the tables gives the complete data report in percentages of the group response to five selected procedures. This complete report is available upon request.

It is interesting to note the change in response to the question concerning when procedures were learned for residents at different stages of their training. The percentage of residents who report having learned a procedure before beginning the residency is higher for first year residents than it is for second and third and fourth years for many of the procedures. This finding has two possible explanations 1) medical schools are teaching these procedures now and they didn't a few years ago or 2) students interpretation of the term of "learned" changes. He may find out during residency that he really did not know a particular procedure and all of its implications and possible complications as well as he thought he had.

Table 2 gives an list of 15 procedures which many residents state they learned before entering ortho. residency. Some of these procedures are orthopaedic and others are not. Those which are orthopaedic deal mainly with casting procedures. Table 3 presents 34 procedures that few residents knew prior to orthopaedic residency. Table 4 displays 20 procedures, many which appear in table 3, which were not learned by many before the orthopaedic residency and as table 4 shows were never learned by some during the 4 years. Table 5 lists the most commonly performed procedures, mostly casting, and the last table, number 6, lists the procedures most commonly self-taught by reading. If your program had two or more fourth/fifth year Resident Procedures Forms at the time that the data was sent to analyses you also have 3 additional pages which list the number of fourth/fifth year residents from your program who reported they had not learned the listed procedure.

The significance of this study is in the example it provides of a method of gathering detailed information about what residents are learning in residency programs. It may provide a model upon which a core curriculum of "basic procedures all qualified orthopaedic practicioners must be able to perform with confidence" can be derived. It may form the means of discovering continuing education needs for the next year or two.

Table 1

The fifty-eight procedures employed in the Resident Procedures Form

1. Inject a painful joint
2. Manipulate a contracted joint
3. Debride an open fracture
4. Perform split-thickness skin
5. Suture a lacerated tendon
6. Repair a lacerated blood vessel
7. Apply a bone plate
8. Apply a short arm cast
9. Apply a long arm cast
10. Apply a shoulder spica cast
11. Reduce a Colles fracture
12. Reduce a supracondylar (humerous) fracture
13. Insert a K-wire in a phalanx
14. Release a trigger finger
15. Perform a carpal tunnel release
16. Perform a wrist synovectomy
17. Perform an upper extremity tendon transfer
18. Perform a crossfinger pedicle graft
19. Repair a lacerated digital nerve
20. Write a prescription for corrective shoes
21. Prescribe and check out an A-K prosthesis
22. Apply a short leg walking cast
23. Apply a cylinder cast
24. Insert a tibial traction pin
25. Manipulate a congential hip dislocation
26. Non-surgically manage a c club foot
27. Reduce a traumatic hip dislocation (closed)
28. Saucerize an infected tibia
29. Internally fix a medial malleolar fracture
30. Perform a knee meniscectomy
31. Insert an medullary rod in a femur
32. Internally fix a reduced fractured hip
33. Insert a hip prosthesis
34. Perform a hip arthroplasty
35. Apply a Minerva jacket
36. Apply a correctove cast for scoliosis
37. Prescribe and check-out a Milwaukee brace
38. Perform a needle biopsy of a lumbar vertebra
39. Take an iliac bone graft
40. Perform a innomiate osteotomy
41. Perform a posterolateral lumbar fusion
42. Insert Harrington rods
43. Perform a laminectomy and discectomy
44. Perform a costotransversectomy
45. Perform an anterior cervical fusion
46. Perform a fore quarter or a hind quarter amputation
47. Perform and interpret an myelogram
48. Perform and interpret an arthrogr
49. Perform and interpret a nerve conduction test
50. Perform and interpret an EMG
51. Insert an endotracheal tube
52. Insert a chest tube
53. Perform a tracheostomy
54. Manage a patient in shock
55. Perform cardiorespiratory resuscitation
56. Give a legal deposition
57. Give expert testimony in a court of law
58. Evaluate a disability and report your findings in a form acceptable to a compensation board

Table 2

Procedures that first year residents stated they learned before beginning orthopaedic residency

More than 75% learned

1. Inject a painful joint
8. Apply a short arm cast
9. Apply a long arm cast
22. Apply a short leg walking cast
51. Insert an endotracheal tube
53. Perform a tracheostomy
54. Manage a patient in shock
55. Perform cardiorespiratory resuscitation

More than 50% learned

3. Debride an open fracture
4. Perform split-thickness skin
5. Suture a lacerated tendon
11. Reduce a Colles fracture
23. Apply a cylinder cast
24. Insert a tibial traction pin
52. Insert a chest tube

Table 3

Procedures that less than 25% of the first year residents stated that they learned prior to beginning orthopaedic residency

2. Manipulate a contracted joint
7. Apply a bone plate
10. Apply a shoulder spica cast
14. Release a trigger finger
16. Perform a wrist synovectomy
17. Perform an upper extremity tendon transfer
18. Perform a crossfinger pedicle graft
19. Repair a lacerated digital nerve
20. Write a prescription for corrective shoes
21. Prescrobe and check-out an A-K prosthesis
25. Manipulate a congenital hip dislocation
27. Reduce a traumatic hip dislocation (closed)
28. Saucerize an infected tibia
29. Internally fix a medial malleolar fracture
31. Insert an medullary rod in a femur
33. Insert a hip prosthesis
34. Perform a hip arthroplasty
35. Apply a Minerva jacket
36. Apply a corrective cast for scoliosis
37. Prescribe and check-out a Milwaukee brace
38. Perform a needle biopsy of a lumbar vertebra
40. Perform an innominate osteotomy
41. Perform a posterolateral lumbar fusion
42. Insert Harrington rods
43. Perform a laminectomy and discectomy
44. Perform a costotransversectomy
45. Perform an anterior cervical fusion
46. Perform a fore quarter or a hind quarter amputation
48. Perform and interpret an arthrogram
49. Perform and interpret a nerve conduction test
50. Perform and interpret an EMG
56. Perform cardiorespiratory resuscitation
57. Give expert testimony in a court of law
58. Evaluate a disability and report your findings in a form acceptable to a compensation board

Table 4

Procedures that fourth year residents stated they never learned during their training to date

More than 10% never learned

35. Apply a Minerva jacket
36. Apply a corrective cast for scoliosis
37. Prescribe and check-out a Milwaukee brace
40. Perform an innominate osteotomy
42. Insert Harrington rods
43. Perform a laminectomy and discectomy
47. Perform and interpret a myelogram
48. Perform and interpret an arthrogram

More than 25% never learned

6. Repair a lacerated blood vessel
18. Perform a crossfinger pedical graft
38. Perform a needle biopsy of a lumbar vertebra
45. Perform an anterior cervical fusion
46. Perform a fore quarter or a hind quarter amputation

More than 50% never learned

44. Perform a costotransversectomy
49. Perform and interpret a nerve conduction test
50. Perform and interpret an EMG
56. Give a legal deposition
57. Give expert testimony in a court of law
58. Evaluate a disability and report your findings in a form acceptable to a compensation board

Table 5

Procedures most frequently performed, taken from responses of fourth year residents

Performed more than 30 times by more than 50% of the fourth year residents

1. Inject a painful joint
8. Apply a short arm cast
9. Apply a long arm cast
11. Reduce a Colles fracture
20. Write a prescription for corrective shoes
22. Apply a short leg walking cast
23. Apply a cylinder cast
24. Insert a tibial traction pin

Performed more than 30 times by more than 25% of the fourth year residents

4. Perform split-thickness skin
26. Non-surgically manage a club foot
32. Internally fix a reduced fractured hip
39. Take an iliac bone graft
51. Insert an endotracheal tube
54. Manage a patient in shock

Table 6

Procedures most commonly self-taught through reading

Percentages of the total group so reporting for the proecdures below range from 8 to 14 percent

1. Inject a painful joint
5. Suture a lacerated tendon
11. Reduce a Colles fracture
12. Reduce a supracondylar (humerous) fracture
18. Perform a crossfinger pedicle graft
19. Repair a lacerated digital nerve
20. Write a prescription for corrective shoes
26. Non-surgically manage a club foot
27. Reduce a traumatic hip dislocation (closed)
38. Perform a needle biopsy of a lumbar vertebra
48. Perform and interpret an arthrogram
54. Manage a patient in shock

Table 7

Procedures more than 50% of the residents learned from other residents

1. Inject a painful joint
3. Debride an open fracture
4. Perform split-thickness skin
8. Apply a short arm cast
9. Apply a long arm cast
11. Reduce a Colles fracture
22. Apply a short leg walking cast
23. Apply a cylinder cast
24. Insert a tibial traction pin
52. Insert a chest tube
53. Perform a tracheostomy
54. Manage a patient in shock
55. Perform cardiorespiratory resuscitation

ESSENTIAL COMPONENTS
of
ORTHOPAEDIC COMPETENCY

Report of

The Task Force

Edited by

James Monahan

Orthopaedic Training Study
Center for Educational Development
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INTRODUCTION

Originally proposed as the preparation of a core curriculum in orthopaedic surgery, the idea for defining orthopaedic content became, by the time the Task Force met, the job of stipulating the essential competencies every resident should have acquired by the completion of his residency. It had been hoped by the proposers*, that there would be generated content guides, especially in the basic sciences, and that these would be made available to whichever training programs desired them. As a consequence, and prior to the September, 1971 meeting of the Task Force, several orthopaedic physicians prepared preliminary papers detailing essential orthopaedic content in several sub-areas. These papers varied in format from outlines of information to collections of behavioral objectives. It was from these papers that the Task Force worked in developing the final document, "The Essential Components of Competency," initially seeing the job as one of editing.

In the course of compiling the final document, the original charge was re-evaluated and found to duplicate many previous, and other committees' work. The job of editing the original paper then turned into an educational task of writing general outcomes of an orthopaedic residency, a statement of abilities one may reasonably expect in a physician entering the practice of orthopaedic surgery upon the completion of a residency.

The Task Force deliberately left the evaluation consideration to the training program chiefs and others, in order to avoid construction of a curriculum and standardization of programs. The construction of a curriculum, i.e., content selection, instructional methodology, learning experiences, etc., remain with the chief because the competencies are stated as general objectives and not as specific instructional objectives which would include the conditions for evaluation and the degree of competency to be demonstrated.

The most difficult problem which faced the Task Force was the definition of the categories of competence. The grappling with this problem is in this verbatim report, but it seems necessary to prepare the reader for the convolutions in the struggle. The struggle for the definition of the eventual three categories* stems from a number of things: dispute over classifying the degrees of competencies of an individual as opposed to classifying disease entities and their treatment; dispute over terms indicating competency; misunderstandings in regard to the meaning of referral and the things to be referred in the third category of competence.

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*The chiefs of training in the sixteen experimental programs of the Orthopaedic Training Study at their annual meeting in 1970.

Some of the work done in this meeting was accomplished in small group work of which no recording was made. However, the reports of these groups, as presented here, include some of the rationale behind the decisions reported.

Members of the Task Force were allowed the privilege of amending their remarks as presented in this manuscript.

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*See Appendix, p. 97.

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**Not present.

The original Component papers:

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Hand - Dr. Swanson

Rehabilitation - Dr. Edholm
Dr. Garrett

Basic Sciences - Dr. Cooper
Dr. Jowsey

Medical-legal - Dr. Ware

Trauma - Dr. Parks
Dr. Spencer

Surgical principles - Dr. Herndon

Adult Reconstruction - Dr. Peterson
Dr. Winters

Fractures - Dr. Brower

* * * * * * *

The Thursday Session

Mr. Monahan: The task we have before us today is to take the preliminary proposals for the essential elements of competency, and turn them into one document having a consistent format. The tasks preliminary to the production of this single document include decision as to the appropriate format, decision on the specificity of the content in this document, and considerations on other includable material. This last point should involve consideration of the inclusion of a statement on attitudes which should be developed in a resident and whether or not there should also be statements about the specific skills which a resident should have acquired at the end of his residency. The need for this document, which we will produce, can be explained at least in relationship to the proposal for a phased residency. A phased-residency task force under the direction of Dr. Charles Gregory has as its task the definition of a residency program, not in terms of time spent in the program, but in the level of achievement an individual makes; given a statement of competencies, a resident's training would conclude with the attainment of those competencies, whether the time spent to achieve them is four, three, or five years. But, obviously, before such considerations can be made, a statement of competencies must be produced, and this document will be toward that end of helping to achieve the goal of a phased residency program.

Dr. Swanson: Your idea, then, in putting together all of these essential components in a work form is so that it can be used as a curriculum by a director of a program. When I went over these documents, I had some very sudden and very strong thoughts. First of all, the material that's in the parts is so broad and so far reaching that you would have to be the most brilliant physician in the world to know everything that's there. In some places, people have said something to the effect that a resident ought to just know this book.

Dr. Brower: I think that's what he is talking about in format. If you are going to use this for a measure, you have to go back to Mager and the definition of objectives. But I would agree with your comment on most of the components that I saw. They were taking the contents of a book and putting it down as objectives. The one we have on Children's is about the most succinct and properly arranged one that I saw.

Dr. Ryder: Well, Jim, probably the problem is for us to decide whether we want to try to use this objectives' format.

Perhaps you are suggesting that we ought to try to use the format of Gronlund*, which is sort of modified Mager**.

Mr. Monahan: I didn't want to suggest any particular one, but to offer several as a consideration. I might just say that, personally, I feel that Gronlund is a little easier to teach from.

Dr. Brower: Excuse me. Now you are using two different words here. You say that you want to see if a fellow has accomplished something before he leaves the program, and then you use the word "teach". Now you have got to decide which one you are going to do.

Mr. Monahan: When I use the word, "teach", I mean to say that, from Gronlund's point of view, one teaches for the understanding that is stated in the instructional objective. Now to demonstrate that this understanding is achieved, the instructor sets up a number of alternative behaviors which, when exhibited in the residents--any one or a combination of them--determines that he has achieved the understanding you were teaching. If the objective, for example, were for the resident to achieve an understanding of reducing fractures of the lower extremities, then a number of alternative behaviors would consist of a list of fractures he would have to reduce in order to demonstrate that he understands fractures.

Dr. Brower: Measured how?

Mr. Monahan: Whatever way you would state it.

Dr. Brower: Well, in fractures, let's assume that there are a number of toughies, and if he can handle those toughies, he can handle the simple ones, much as in the Children's paper. You get to the nitty-gritty of it, and we can assume that if he understands that, he can certainly fix a flat foot if it comes along. But we have the problem of deciding what are the significant fractures in one area.

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*Norman Gronlund, Stating Behavioral Objectives for Classroom Instruction, New York: Macmillan, 1970.

**Robert Mager, Preparing Instructional Objectives, Palo Alto, Calif. Fearon Publishers, 1962.

Dr. Ryder: It seems that the first thing we have to do is decide on a format and we have two general options: one is, as it were, a curriculum outline form, and the second is to try to convert these papers into statements of the behavior of the resident at the end of the training period.

Mr. Monahan: You might also want to make some decisions upon content, that is, is it feasible to ask a resident to know a particular piece of information? Or could the content be categorized, as Dr. Swanson was suggesting in his component on the Hand?

Dr. Swanson: While we call them categorization of competence, there is material that everyone ought to know, material only some people ought to know, and material that only the specialist needs to know. We have carried it out to four categories and much of it has to do, not with the accumulation of the knowledge, but with the responsibility of that knowledge, the dangers to a patient from inadequate knowledge. For example, at the bottom of a scale might be the ability and the knowledge to pull the tongue out of a patient's throat, and then you take it all the way up to the top where you have someone who is doing some writing and research on anoxia. The guy who pulls the tongue out of the throat doesn't have to know about the oxygen-carrying capacity of hemoglobin.

Dr. Ryder: It seems as though we have two over-lapping aspects to consider. 1) What we might call the total scope of this whole thing, how we consider training super-experts in everything. This seems a little out of hand. And 2) the other aspect is levels of expertise that you, Dr. Swanson, used and which are also illustrated in the Hiss/Vanselow* statement for internal medicine competencies. Now on the scope level, I suppose, we should be relating to the concept of what the board presumably examines for, which is minimal competency; our total program should fit within that scope. Any individual program is going to have areas way outside of that, nevertheless we are concerned with the minimal competencies being the border lines or boundaries of our scope statement, and then within that we have to define the levels of expertise, because it has been said, for example, don't expect every resident to do a competent job with Harrington rods, but we as sure as hell expect him to do a competent job with every fracture that comes along.

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*Roland Hiss and Neal Vanselow. "Objectives of a Residency in Internal Medicine." Association for Hospital Medical Education, 1911, Jefferson Davis Highway, Arlington, Va.

Dr. Swanson: This is where we have to come to a meeting of minds though. There just is too much material in the scope, but there is nothing wrong with that, actually, because this is the scope of orthopaedics.

Dr. Ryder: Right.

Dr. Swanson: What I understand you as saying is, identify in this scope the basic minimum.

Dr. Ryder: Some things we could probably very clearly and easily eliminate. For example, in this very complete and excellent outline of basic sciences, it says the residents should know crystallography, electronic mycroscopy, etc.. That is fine if he is going to be a research orthopaedist, but that is not within the scope of our activities here.

Dr. Brower: If I might just question one word you used there, and that's competence. After kicking around on the Board in the In-training Exam*, I think people have finally realized that we can recognize incompetence easier than competence. And if we can recognize incompetence, we will assume that whatever is left is competence; that is to say, if he cannot do this much, he is incompetent.

Dr. Swanson: I am not so sure I would agree fully with that.

Dr. Brower: Can you define competence?

Dr. Swanson: The ability to accomplish.

Dr. Brower: All right. Can you measure it?

Dr. Swanson: Why hell, yeh! Put him up to bat and see if he strikes out.

Dr. Brower: Oh, I can do it in sports, the most accurate measure there is, but when it comes to education, we don't have anything like that.

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*A multiple choice, patient-management problem examination given yearly to orthopaedic residents.

Dr. Winter: Can you do it without patients?

Dr. Swanson: That's a good question, but I think that we have to disregard implementation when we are working with this paper.

Dr. Brower: Run that by me again?

Dr. Swanson: Implementation means the utilization of knowledge, the effect of knowledge.

Dr. Brower: And you are saying, as long as he knows how to swing the bat?

Dr. Swanson: No, no, not just that, he has to know the rules of the ball game. I can analyze him: he's got a good swing, he's got a good eyeball, he tracks the ball, he does everything else, but if I say, O. K. man, I'm taking out the pitcher and you're going to go up and bat, I don't know what he is going to do. But that's where I have to stop, I can't go any further than that, and I think that's where we are here. I think the selection of whether or not he is going to be able to hit the ball is what the scout found out from watching him in high school, and it's what you are doing when you are choosing him out of the internship for the residency.

Dr. Olson: I think we are confusing here his ability to do with whether or not he will actually do it, and we have no way of knowing that.

Dr. Brower: I am getting ahead of myself. That's what the Board is supposedly to decide.

Dr. Huncke: If you don't get down to basics, whatever we do here today will be lost in another two or three years. We are in a dynamic field. I don't know what might be done in detailed treatment for disease five years from now, whether you are talking about hips, knees, hands, or whatever, and if you try to go into more accurate content in all sorts of details--you should know this about the pathology of the knee or that about the pathology of the hand, or ten different ways to treat the hip--it might be fine for 1971 and maybe the first half of 1972.

Dr. Ryder: Yes, I think that's sort of half on and half off. One thing that ought to be recognized is that any training objectives drawn up now will have to be revised periodically.

Dr. Huncke: Well then we have to decide what is minimal competence, what is absolutely essential.

Dr. Swanson: Then it comes right down to the basic physiology and the basic sciences and the application of these. The human body and its responses are not going to change very much.

Dr. Ryder: Could I suggest then, a very broad objective for these training programs which might go something like this: at the end of the training period the resident will be able to give effective medical care for people with musculo-skeletal problems. It's a broad, general objective, but it means that he is not going to run the electronic microscope. It does not mean that he is going to be able to do every exotic procedure invented, but I hope it might imply somewhere or other that he is going to be able to continue to learn when he finishes his residency.

Mr. Monahan: We might go another step further then and define what effective care is, saying that what you state in this document does, indeed, constitute effective care.

Dr. Swanson: I think we can go back to that definition of Dr. Ryder's. Orthopaedic surgery is the medical specialty that includes the investigation, preservation, and restoration and development of the form and function of extremities, spine and associated structures by medical, surgical and physical methods. This is essentially what we are trying to do.

Dr. Ryder: Except that I wonder if the objectives of the training program really stress the investigation part.

Miss McGuire: This task force will not tell anyone how to evaluate a resident's ability, nor how to accomplish the education for it. All we say is what ought to have been accomplished during the program.

Dr. Brower: Then you will have to decide what you are going to write, either a curriculum or objectives.

Dr. Swanson: I think Dr. Ryder's earlier statement is that what we have done is to make a scope statement of what a resident has to know. The next step would be to decide from this scope what we are going to get.

Dr. Ryder: We have fully stated the scope in this broad objective of the residency program.

Dr. Swanson: Now the objective is we want a practicing, orthopaedic surgeon who will make contributions in his field to the patients, and to the specialty, and to society according to his ability.

Miss McGuire: What I heard Dr. Ryder saying is that in defining the Essential Components, we would put the stress on health care delivery.

Dr. Ryder: Right. We are trying to make an orthopaedic surgeon, not an orthopaedic scientist nor an orthopaedic teacher, while we might hope that some of them do follow these paths. But our objective is, mainly, to produce a Doctor.

Mr. Monahan: And as a contribution to that process, we are taking the initial step of setting down general objectives, leaving to the specific schools the general content development and a determination of instructional strategies or techniques.

Dr. Brower: Well as far as I can see, we are still running around the point, and I would like the point offered. I have been on a curriculum committee in a medical school for six months, and I have come to the shocking conclusion that there is no such thing as a curriculum in a medical school: no one can tell you what is taught in a medical school. They can give you the block times and the guy who's in charge. And I want to know--are we going to prepare an essential curriculum or are we preparing instructional objectives which are measurable. That's all I want to know.

Miss McGuire: It seems to me that what we are doing is defining the instructional objectives in two fashions: one fashion is what behavior an individual should demonstrate and, secondly, what content he is going to apply or demonstrate knowledge of.

Analysis of Individual Components

Mr. Monahan: As we begin this discussion of the proposed components, will you consider the question of content specification to the end that we can prevent frequent revisions of this statement; for example, we don't want to require that a resident be able to demonstrate five methods of nailing a hip and find that in a few years only two or three are acceptable.

Dr. Winter: Or do you get around that by saying that he must use the method most prevalent, because there are so many areas where no method is official.

(First component taken up was Dr. Ryder's paper on Children's Orthopaedics).

Dr. Swanson: Can you summarize this, Dr. Ryder, as you developed it? Explain the words, for example, what you mean by "cognitive domain," etc., how you understand them as an orthopaedic surgeon.

Dr. Ryder: Oh, I would think that the "cognitive domain" in orthopaedic surgery has been those things which we do out of our intellect; knowledge, application, a synthesis, these are the categories of the "cognitive domain" as prepared by Bloom*. The "psychomotor domain", which in the educational world is virtually unexplored, is pretty obvious to us because we do deal in the psychomotor skills area. The affective domain**, I suppose, is the area of feelings, having such categories as accepting, receiving, etc. Matters in the affective domain are what we are talking about in the category of attitudes.

Dr. Edholm: I think it would be good if all these components could be cast in this terminology, but I don't know how easy or how difficult it would be.

Dr. Ryder: Well, one problem I had in doing this was the problem of the category of expertise, which is a nice term coming from this Hiss Internal Medicine outline. In trying to solve this problem, I came out with such things as, "he will independently," or "in consultation and collaboration with other individuals, he will . . .," and "as a member of a team he will . . . ." And I think that these categories of expertise do add quite a dimension to the scope. So if we can use, first of all, the general structure of the objectives without being compulsively Magerian about the criteria or conditions, and add to it the concept or levels of expertise, I think we have the structure into which we ought to try to cast all of these things.

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*Benjamin S. Bloom, et al., A Taxonomy of Educational Objectives: I, The Cognitive Domain; New York: Longman, Green & Co., 1956.

**David Krathwohl, et. al., A Taxonomy of Educational Objectives: II, The Affective Domain: New York: David McKay Co., Inc., 1956.

Dr. Swanson: I agree with you.

Dr. Huncke: Another category, one that Parks used in his paper on trauma, is "Recognize and Manage." I think Dr. Parks' description takes into consideration how we all really practice. And I think we have to take into account patterns of practice.

Dr. Ryder: Right. We could never ever come to the point where we have a document that covers every possible situation that could arise to the graduate of an orthopaedic training program, which brings us back to the scope and the term, "minimal competence."

Dr. Huncke: But I really hate to use the word "minimal," it sort of grates on me to think of doing anything minimally.

Miss McGuire: That's why, I think, perhaps the term "Essential Components" is better. It suggests that this is what everybody, who is adequate, has.

Dr. Swanson: What about using the word "competent" instead of "adequate."

(Everyone agrees)

Miss McGuire: Well it would be great if we could agree this quickly on a format.

Dr. Swanson: Well let's hear some dissenters, we have heard too many assenters.

Dr. Brower: I, personally, can't yet apply it to my little paper on fractures, so I would like to present what I have, and you can either shoot me down or support it. I assumed that the gross management of trauma was covered in Dr. Parks' paper and what I was assigned was the specific fracture. This section is designed to offer the resident some concise objectives for fracture management, at the same time allow a degree of measurement of the proficiency the man has accomplished at the end of his training. We started out with simple fractures of the hand:"The resident must treat a fracture of the neck of the fifth metacarpal with 45 degrees angulation. The treatment is to be observed by qualified supervisors from initial workup to reduction in fixation and final result. The resident must use the method most prevalent in his area and list and describe two alternative measures. He must be able to list two complications in the result of treatment." Now, is that too specific?

Dr. Swanson: I think, if you left off the degrees of angulation, that would be fine.

Dr. Brower: I agree with that.

Dr. Ryder: Well it seems to me, Tom, that it comes out as an evaluative statement.

Dr. Brower: Yes, it does.

Dr. Ryder: And all it needs is the re-statement as an objective and not as a test.

Dr. Swanson: The objective here is to get a functioning hand that is not stiff, which will have good grasp with strength, right?

Dr. Ryder: But that's not the teaching objective, Al, that's the objective of a treatment.

Miss McGuire: Is the thing that we need here, such as, the resident will be able to treat effectively and obtain a functional result of the neck of the metacarpal, and he must recognize alternate methods of doing so, and must recognize at least two major complications that might arise?

Dr. Brower: Our difference takes me back to what I was discussing with Al before, in using the sports analogy. Do you want to know if this resident is a .325 ball hitter, or if he has just the capacity of hitting the ball?

Dr. Edholm: Or to change it this way, say the resident will treat a fracture of the fifth metacarpal in such a way that normal function is restored. Then if you want to go on to Gronlund's idea and write sub-objectives beneath that, say he will recognize the complicating factors, or be able to state the complicating factors, then your objective in the orthopaedic program directs you to the fact that he is at least going to be able to treat, or have experience in treating, a fracture of the fifth metacarpal. And some where along the line you will find out and know if he can handle the bad ones.

Dr. Brower: Well I can't see much difference from handing him a book, saying just read books on fractures. I want to know how he can perform, and the only way I can measure that is to have some supervisor see him do it.

Miss McGuire: But I thought that we had agreed that we were not going to worry, at this point, about either how you teach it or how you test it. We are simply going to say what we expect of him when he is through and what you expect of him is that he can diagnose and manage effectively this particular fracture.

Dr. Brower: If I were to take each fracture in the human body and write it out like this, I would be writing a book.

Dr. Swanson: In this area of fractures, you first of all have to know the concept of treatment and then go to the big shank of what you are going to do and then to the pitfalls, and one of the pitfalls is a Bennett fracture in the area of fractures.

Dr. Brower: That's what I was trying to do. In sitting down and looking at the upper extremities, I tried to think of the pitfalls in these fractures, and if a guy can work his way through them, we must assume that he can handle the others. Isn't that what you are after, Al?

Dr. Swanson: Exactly.

Dr. Brower: All right, that's why I was picking up the hand. The ones that I have had trouble with are 1) fracture of the fifth metacarpal, 2) the oblique fracture of the proximal phalanx, and 3) the Bennett's. Now we could talk about all the others, the crushed hand, etc., but I am not interested in that in this picture. That's the problem in massive injury. Then we go up the forearm, I could talk about Colles fractures, the Piedmont fracture, and a few others, and then go to the elbow. Now, do I list them as specifics, or as Dr. Ryder did? Is that what you are trying to tell me?

Dr. Winter: Are you defining a pitfall as one in which there is no right, or very clear, way to do it?

Dr. Brower: Not necessarily. He's got to know one way of getting out of it.

Dr. Winter: Well I'm sure if we are going to get very far beyond just a curriculum here, a guy has to know when he has achieved that goal.

Dr. Garrett: Are you defining fractures as those which only an orthopaedist would deal with?

Dr. Brower: Basically, I am, yes.

Dr. Edholm: You might need a preamble. The orthopaedic surgeon is expected to treat all fractures of the upper extremities. Item 1 - Objectives. Then go on from that point. Then you are emphasizing the ones that are problems after that.

Mr. Bligh: I think something that might clarify some of this discussion is to go back and look at the purposes for creating this document and decide on some emphasis. For example, we said, one use is by a chief to decide whether he is making provision in his program for a resident to learn certain things. Also, for a resident to use as a score card in determining that he has learned or had exposure to certain things, for Academy program planning courses, etc., for Board exams, and for criteria of flexible scheduling. Now if you are going to use it for Board exams, you have to be very specific as Dr. Brower has been writing his objectives. If you are just using it for residents and the chiefs, to make determinations on whether or not the resident has been exposed to certain things, you may not have to be so specific. Is there any way we can decide what emphasis we want to put on this, whether we should include at this point objectives from which people can write exams, or objectives from which people can organize a curriculum.

Miss McGuire: I would opt for the one which is most directly to the training chief and the resident. Even there, the training chief has to go a step further and say how he is going to provide such experience. Similarly, I would want the Board to take the responsibility in going a step further and asking, how it is going to test this. But let us simply, at this point, say what it is he is to demonstrate.

Dr. Winter: And with what degree of proficiency?

Miss McGuire: Right. Should he be able to recognize it and should he even also be able to manage it. Should he be able to manage it independently, or in consultation with others, or as part of a team?

Dr. Ryder: Would it be good, or tedious, at this point, to sketch the cybernetic cycle of the educational process, because we seem to be hitting into it at several different points where we should be hitting it at one point.

Miss McGuire: Well, I'll just draw the feedback cycle. (See Figure I). If you are planning any educational program, you have to start out with some set of objectives that define where it is you want to get. Having defined those specific objectives, you can then say what kind of learning experiences - by the way, in recent lingo the word "opportunity" is being substituted for experiences.

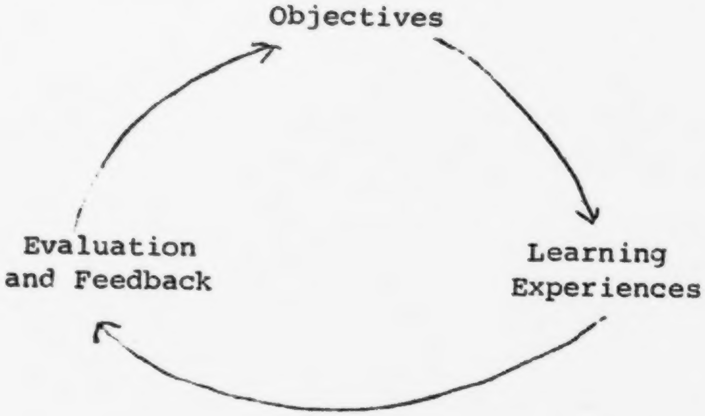

Figure I.

From the same set of objectives you can then develop a test or evaluation materials to determine whether or not you have achieved those objectives, and then where you find you haven't achieved the objectives, you then have to make decisions as to whether you should modify the objectives or the materials which are designed to achieve them. And I think that what we are trying to do here is to develop materials at the objective's level which can be used by people to develop learning activities and materials.

Mr. Monahan: I would like to add two other steps to that. (See Figure II). I would like to add the first step of aims, which corresponds to the statement Dr. Ryder read earlier--the aim of an orthopaedic residency. Then move to another set of objectives, which are similar to Dr. Ryder's paper, which are general objectives, then move to the step where Christine began--the specific instructional objectives, which would parallel what Dr. Brower has been outlining. And the question I see us faced with is this: which of these two types of objectives will be produced, or will it be a combination of them. This circle now, as I have amended it, is similar to Tyler's* three levels of specificity in his curriculum development plans, the first being a very general, broad aim, stating the intent to develop a competency; the second level will specify what the competency is; and a third level will specify those things which are needed to be accomplished in order to achieve that competency.

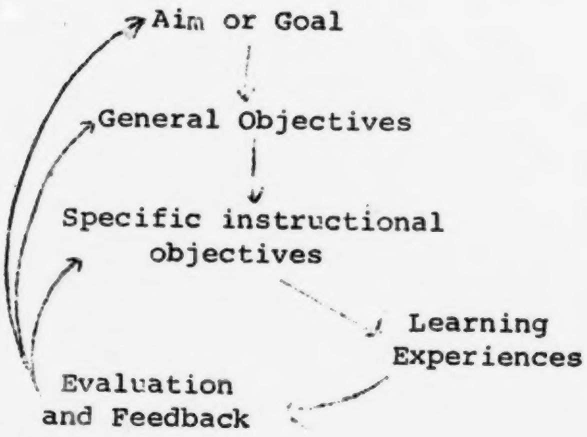

Figure II.

Miss McGuire: And I think we are shooting at that middle level.

Dr. Ryder: Jim, can I add one more thing just by way of orientation. The history of the Orthopaedic Training Study, of which we are all now a part in this meeting, is quite entertaining. The Orthopaedic Training Study entered this circle at the feedback point to evolve the new Board examination; it worked backwards to help develop innovative methods of teaching, and then the last step came all the way back to the objectives, where logically it should have started.

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*Ralph Tyler, Basic Principles of Curriculum and Instruction. Chicago: University of Chicago Press, 1949.

Dr. Brower: Where is the logical place to start the circle? Does it matter, as long as you get around the circle?

Mr. Monahan: The place to begin in the circle is where the people who are beginning are in their thinking.

Dr. Garrett: Back to Dr. Brower's problem. For all simple fractures every orthopaedist should be able to diagnose, manage, and follow through. Then when you get more complicated, say with the vascular injury, he should manage it in conjunction with somebody else. Because it is silly to just list the fractures as Dr. Brower has been saying.

Dr. Huncke: This may get down to basic principles, then. If you are talking about hands and the problem of edema, the real critical thing--even if he is talking about a fifth metacarpal or metacarpal dislocation--the important thing is that he recognizes certain basic principles which include the problem of edema, the patho-physiology, etc.

Dr. Ryder: If we can turn that into an objective, we are in business. We could say the resident will be able to discuss the positioning and the application of dressings when the hand has been injured and justify the treatment. Then you have an objective.

Dr. Huncke: And another aspect of this in hands, and particularly orthopaedics, involves attitudes. We have to know what the patient does for a living; you may manage his hip or his back or his hand in one fashion, if he is an iron worker, and in another fashion if he is a first violinist in a symphony orchestra.

Dr. Ryder: You could keep that in a cognitive domain and say, given patients with hand injuries the resident will be able to list the characteristics of the person.

Miss McGuire: He would adapt the treatment to the life style of the patient.

Dr. Huncke: Or list principles of management which include -

Dr. Swanson: Which are common to all men and then the application of--the end result will depend upon many factors.

Dr. Ryder: Identifying the individual characteristics of a patient may require modification of the individual treatment.

Dr. Swanson: Basically, when we evaluate an impairment, we are not concerned at any time with who that man is.

Dr. Huncke: Talking just physical disability.

Dr. Swanson: The impairment. And we start out in our treatment with that same goal, treating the human being because he has anatomy, which is common to all men, and physiology, which is more or less common among all men, and we have to know that as our basis for being a physician.

Dr. Huncke: Of course that comes down to "treat effectively," I know, but you don't treat the impairment across the board the same way.

Dr. Swanson: I agree that there are possibilities for immediate reconstruction in trauma. To do the reconstruction when you initially treat for trauma.

Dr. Edholm: But if you don't get them at that time! But, of course, we are talking about fractures, and I am bringing up reconstructive problems, and that's different, I agree. And maybe that statement is true with acute trauma.

Mr. Monahan: Do you think you are also talking about attitudes here, and that we should make two statements? You may make your statement about treating effectively, then in another statement you state that effective treatment includes recognizing the individual's life style. This recognition is an attitudinal element in treatment.

Dr. Swanson: Jim, I think you could say the functional requirement of the patient--that would cover considerations of social status, life style, etc.

Mr. Monahan: Then do you want to put that into the objective, that he treat the patient considering his functional requirements?

Dr. Edholm: If you wanted to write it later into the affective domain, you could do that. But then you would change the manner of evaluating it, too.

Dr. Swanson: In the articles I have written on fractures, I always say you treat the patient, the limb, and then the impairment. That's the way you start out with the consideration of the patient. Now when I went over this material again last night, I was impressed enough to think that on my own--for my situation--I would put all of this together in some sort of booklet so that everybody on the staff and all of the residents could look at it as well as myself without changing it at all. Because there are different approaches that, I think, are interesting--Charlie's approach, somebody else's approach--and I am not saying that one is best. All that detail there in the basic sciences was interesting, and I would shock the hell out of some of my residents.

Dr. Brower: What you are leading up to, Al, is what Mager* is talking about as adult education. The content of a course is usually kept a secret from the student. He is supposed to figure it out some way. And the instructor may not even know! So what you are saying is that you are going to get an outline and tell a resident, "You are a grown man and this is what we are going to try to accomplish in the next three years, and I am going to try and help you, but when you think you are not getting something, you come and tell me and we will try to figure it out". And I think that's fantastic.

Dr. Ryder: It frees the instructor to become a resource. The guy knows what is expected of him, and I am now a resource for that information.

Dr. Swanson: When a resident comes up to me and asks me specifically for something, I often react--well, you can help me get that to you.

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*Robert Mager and K. M. Beach. Developing Vocational Instruction. Palo Alto, Calif.:Fearon Publishers, 1967.

Miss McGuire: Do we agree that we would like to see the fractures paper somewhat recast in terms of format, employing Dr. Garret's earlier suggestions about two different levels?

Dr. Garrett: I think another thing that could be stated in there is that the resident should be able to treat all fractures of the extremities and the spine, rather than all fractures, so that some are excluded, such as the mandibles.

Dr. Winter: Once you have done that, then what is the resident not expected to do in the realm of fractures? He is not expected to provide specialty care of soft tissue complications, but he certainly has to provide recognition and whatever first aid care is indicated.

Dr. Garrett: Once it is divided into simple fractures without complications, and those complicated by other injuries in the area of massive trauma.

Dr. Brower: What you are saying is what the guy did in the paper on trauma, and that's why I am saying all I am worried about is specific fractures. And when you get to specific fractures, I have a hard time defending how he is going to buck it some place else. The buck stops here.

Dr. Swanson: Exactly. In fractures the orthopaedist has got to be able to take care of all.

Mr. Monahan: Well can someone give me an objective on this point?

Dr. Swanson: I think Bill just told you.

Miss McGuire: He will be able to recognize, treat, and manage all fractures of the spine and extremities --

Dr. Swanson: And associated structures which include the gridle, shoulder and pelvis.

Dr. Huncke: Does this mean you do not expect him to recognize or evaluate patients with head fractures?

Dr. Edholm: Why don't we say all fractures of the skeletal system excluding the head.

Dr. Swanson: But the definition of a thing should be positively stated.

Dr. Brower: You should be telling him what he does do rather than what he does not do.

Dr. Swanson: I don't like excluding the head.

Dr. Edholm: I don't know that there are any orthopaedist who do work on the head, there might be some.

Dr. Swanson: But you can say the same thing by saying extremities, spine and associated structures. But you are not talking about any other kind of injury or abnormalities, you are simply talking about factors here.

Dr. Huncke: Well if he is an orthopaedic surgeon and a doctor he's got to know something about the head and the face. If he gets a guy from an auto wreck with a floating maxilla, he damn well better know a little bit about that.

Dr. Edholm: If we're going to have another set of objectives that are trauma, then Brian's point should be brought up there. And just leave these as objectives for the fracture section.

Dr. Swanson: Well there are certain people in orthopaedics who want to work on the mandibles and you certainly can't exclude them. If you say associated structures, the next question is what does that mean? So you say well the mandible is indirectly associated with the spine. So by using associated structures you are not really ruling that guy out.

Dr. Huncke: Are we getting hung up perhaps because we may be getting into curriculum rather than objectives. If we are talking about orthopaedic training can we or can we not validly assume that there are certain things the person is coming to us with. Shall we define what basic competence we are assuming in the individual before he gets to us. We should assume that he knows something about circulating blood volume and airways, and, now, we focus ourselves on factors of the musculoskeletal system.

Dr. Edholm: We've got the broad heading of trauma, and there we can say that we expect the resident to know these things ahead of time and stick with just objectives regarding fractures here. And I think it is easier to state what the undergraduate should have learned after we decide what we want to teach him in the residency.

Dr. Ryder: Is this a sensible dichotomy? Should we be separating fractures and trauma?

Dr. Huncke: For it to be manageable, yes.

Dr. Ryder: Well, what I was thinking about in trauma would be an objective that states that the resident would be able to provide emergency care.

Dr. Brower: That's what this guy put down on the trauma paper.

Dr. Ryder: All right, that would be the No. 1 thing, No. 2, would specify musculoskeletal injuries. They would all be under trauma, but it would not imply non-orthopaedic treatment.

Dr. Swanson: One of the things I think we have to be careful about--and not many people are possibly aware of it--that musculoskeletal system is not what we do. We are not treating a system, we are treating a region.

Dr. Brower: Do you want to say anything within six inches of a bone?

Dr. Swanson: I have always objected to musculoskeletal system as I have objected to bone and joint as a definition. But most people do use the "musculoskeletal system". They know what they are talking about when they use it, but they are not talking about the musculoskeletal system, they are talking about the skin envelop, nerves, arteries, veins. When you say spine, extremities and associated structures, you are safe. You don't have to treat the arteries, you don't have to treat the veins, but might have to.

Dr. Brower: Well your point is well taken. One university I was in had a very strong attitude that a resident should never swing a skin flap, and my attitude is that the vast majority of orthopaedic surgeons are going to be doing that; therefore, a resident should be exposed to that in his residency program.

Dr. Swanson: Should we go back to that statement about excluding the head and being more positive in the objective?

Dr. Edholm: And I will stick with that. We are writing objectives here about fractures. We are not talking about objectives for trauma. Excluding these head injuries from the fracture section does not preclude the resident's need to know about them. It would be stated in the trauma section. He would find his need to know it stated there, and there he would learn that for head injuries he must recognize, evaluate, and refer.

Mr. Monahan: Well, is there anything more to say regarding fractures, or does the objective we have written here constitute the fracture section?

Dr. Swanson: Well I still don't agree with that objective. Fractures of the ribs should not be taken up by orthopaedic surgeons. A fracture of a sternum, etc., should be taken care of by a thoracic surgeon. When you say, spine and associated structures, you allow yourself an out. We, obviously, are not going to be treating the head unless we are forced to. Excluding the head is a negative approach to making a definition. We can make the definition but allow it to be broad enough in certain areas so that if someone wanted to include the head, he could. But associated structures, you see, is the clue.

Dr. Edholm: I don't think that's what we are saying the orthopaedist is going to be doing in his practice.

Miss McGuire: I think there are two different things we are arguing. One, what a resident should be able to recognize, evaluate and manage; then there are other things which we only expect him to recognize and evaluate and ask for help. So that's one issue. The other issue is, how do we defeine what this area or region is?

Dr. Swanson: But I say that I am an American, I don't say that I am not a Frenchman.

Miss McGuire: Well I think you're saying more than that. You are saying there are certain specific structures for which he is very much responsible--his prime responsibility. There are other structures which you do not include as part of the basic essentials of competence.

Dr. Swanson: Let the man who will derive the curriculum say that the head is not part of the spine. Don't put yourself on the spot.

Dr. Garrett: Maybe, Dr. Brower, you didn't include trauma in your paper but the trauma paper does include fractures.

Dr. Ryder: Right. We have a lot of overlapping.

Dr. Garrett: And it seems to me that he has covered what we have been discussing. Head injuries should go ahead of simple fractures.

Miss McGuire: So in one of these we want to have the statement of recognizing priorities in multiple injuries. But you are quite right on this trauma one, for example. For the cardio-pulmonary system, Dr. Parks indicates certain things he should be able to manage on an emergency basis only, and certain things not at all, and others, definitively.

Dr. Garrett: Well in his section, which is 1B, he's got the whole concept of fracture treatment as we are trying to list it right now.

Dr. Edholm: Except without Dr. Brower's concern about knowing how to do it or whether he can do it.

Dr. Garrett: Yes, but the whole thing has to be translated into these other terms.

Dr. Swanson: Well, again, all trauma of the musculoskeletal system. The maxilla mandible--it is part of the musculoskeletal system.

Miss McGuire: But he is saying emergency treatment of the musculoskeletal system. Then when he gets over in recognize and manage, he is separating emergency from definitive, etc.

Dr. Ryder: It would be very helpful to us if we define these levels of expertise. How about these definitions in the Hiss/Vanselow outlines? Are these acceptable? These are in Objectives of Internal Medicine residency.

Miss McGuire: It seems as though we have two things, now, wandering around here. One, who it is we are talking about: the general physician or the fellow orthopaedic surgeon at the end of his residency, including the general medical principles that he ought to be able to apply and utilize. That's the guy I thought we were talking about--the orthopaedic surgeon and what every orthopaedic surgeon ought to be able to do. What he ought to be able to do includes some things which are not unique to orthopaedic surgery. Two, at what level ought he to be able to do them. That's what Charlie is suggesting, looking at the internal medicine criteria. There were three levels suggested there. One is being able to carry out all phases of medical diagnosis and management without consultation in virtually all cases. Two is using consultations but remaining the principal physician. Three is recognizing the condition and knowing that it is one in which he does not remain the ultimate physician and transfers the patient to someone else.

Dr. Edholm: We can translate these categories directly into orthopaedic terms. We should not be saying that there are things that we are training a resident just to be familiar with and refer to others. This is not a recognized concept yet, although five years from now it may be. What we should be saying is that he may need consultation, and he may refer the patient later on, but he ought to know what to do for them.

Dr. Huncke: In terms of format, we have the one that Charley used in terms of cognitive, affective, and psychomotor domains and the one Al Swanson took with levels of competency and some aspects of orthopaedic training. Regarding fractures we are not going to have, or perhaps be concerned with, levels of competency, because the orthopaedist is going to be the end point. Reconstructive hand surgery is a different kettle of fish entirely.

Dr. Edholm: Well, again, as far as writing these objectives for a program while you or I as an individual may not do the reconstructive work, a resident must be exposed to it. He must still be expected to be responsible for knowing how to do it.

Dr. Brower: I am not arguing that at all. All I am after is fractures. That was my assignment, not orthopaedic training.

Miss McGuire: Then in certain areas, all we have is one level.

(A discussion followed regarding the practice of calling in neurosurgeons on certain fractures, such as, of the neck, or other consultants in, say, a wrist fracture).

Miss McGuire: Well then do you want to make categories of fractures that describe these different relations: certain kinds that he treats independently and certain types, or other associated injuries, he treats in collaboration with appropriate specialists outside the field of orthopaedics. Then there are certain things he refers to the super-specialist.

Dr. Edholm: Are we going to, for example, be training residents so that when they go out we say, "now when you see an osteosarcoma, I am teaching you not to treat that; you recognize what it is, and you know what ought to be done, but you are to refer it"?

Dr. Brower: No, but you are saying that there are regional specialists who are going to take away my practice. That is what is occurring in practice today; there are super-specialists, who are acting almost regionally. The total hip procedure is a regional thing and in two years every Tom, Dick and Harry is going to be doing it. And that's why, when we talk about referrals to specialists of osteosarcoma cases, I tell them "This is the way I treat it, and this is the way you approach the problem. If you are not capable of proceeding this way, I advise you not to do it then".

Dr. Edholm: I agree with that, but you write it down as an objective among these objectives here.

Dr. Brower: Dr. Winters did it. He did it beautifully in his paper on Adult reconstruction. He said "to know how it is optimally treated". And if you cannot do it so, then refer it.

Dr. Ryder: Then you would say, level one of expertise is defined as follows: the resident is able to conduct a complete evaluation and treatment independently. Level two of expertise: the resident is able to recognize, evaluate and treat in collaboration with. Level three: he is able to recognize and provide (under any circumstances) emergency treatment. Some other specialist will conduct the final and definitive treatment.

Dr. Edholm: Should we call it Type 1, 2 and 3, instead of Level 1, 2 and 3? It implied that Level 1 is more competent than Level 2.

(It is suggested that they be called "Categories".)

Dr. Brower: Then a summary for this discussion of fractures would essentially be the outline under 1B of trauma. No more specific than that.

Dr. Garrett: If you turn the fractures, dislocations, etc., around, and state them in the terms that we are trying to do, some of the pitfalls will come out as subobjectives, but in a more general manner.

Dr. Swanson: Now we've got to talk about treatment methods. If we are going to talk about objectives, the objective is to get the bone in alignment and treat it in such a way that it will heal without residuals. Well what are your treatment methods for that?

Mr. Monahan: But wouldn't that topic be more appropriately left to the individual program?

Dr. Swanson: No, some program might treat everything with an open reduction and some with a closed reduction, but you have to, for example, do an open reduction on the Piedmont fracture or you are an idiot.

Mr. Monahan: But does all that have to be said in this document?

Dr. Edholm: No.

Dr. Winter: Not necessarily, because the methods of treatment might change.

Dr. Garrett: What I was trying to say is that this paper is a statement of the scope, and as we get around to turning it into an educational statement, there will be room for generalities about those principles.

Dr. Brower: Well I suddenly got lost again about the objective for this Task Force meeting. If you say it is to define the scope, and we have done such, where comes the impetus for describing the objective?

Dr. Garrett: If you take this trauma paper, for example, which states the scope, and translate it into objectives as Dr. Ryder has done, then you will turn it into educational terms rather than medical scope terms.

Dr. Swanson: Which is what we want to do.

Dr. Garrett: Which is what we want to do, but we haven't started yet.

Dr. Huncke: In this aspect of education in general, we are getting back to goals. What we are talking about, I think, is the education of orthopaedic surgeons. There are aspects, certainly, of basic science--whatever that bappens to be--that apply, but if you are going to expend effort in training people, you probably ought to limit yourself to just that. Now if you are training ten residents and one of them wants to go on to do electron microscopy of cartilage, and one of them wants to go on to be a teacher, fine. The real task of the American Board of Orthopaedic Surgeons is to evaluate people who are going out to treat people, and our focus should be very clinical. But we cannot divorce a lot of other things from the training, but spending a lot of time, for example, on pathology, has to be looked at very critically; how much pathology do I have to know to treat a Colles fracture adequately? (As loaded as the word adequately might be), how much of this applies to the delivery of health service in the community without cutting it off entirely?

Dr. Edholm: Well, I think that what Dr. Ryder said would help solve that problem. That we separate this into two general areas, and we should prescribe the order in which they are presented, the more basic being presented first, and a separate category in which I think it is necessary to point out how the basics must be tied into management and understanding of a specific condition.

Dr. Huncke: In terms of our task now, it comes down to a combination of what Swanson and Ryder did - the domains and the categories of expertise. Making some assumptions which may or may not be valid concerning the basic aspects of healing.

Dr. Swanson: Somewhere along the line you've got to be arbitrary and say this is our first category, this is our next category, with a little gray area in between.

(A general discussion followed regarding whether or not the whole group should assume the task of categorizing and evaluating these separate components or whether or not the individual who wrote the paper should have the responsibility of re-doing some of it; i.e., to categorize the content according to the levels of competency. Because of the various stages of each individual's understanding of the terminology being used and the variety of value judgements which have to be made, it was agreed that there would be group attention given to all the papers with, perhaps, the individual author making his suggestions first for feedback).

Dr. Ryder: Now we might just take one of these areas, say the trauma-fracture problem right now, and settle it, decide whether these are two areas or not, and then take our categories of competence*, one by one, and put the specific disorders into the appropriate category of competence, which is actually what certain of us have done already.

Dr. Swanson: Well I'll make a challenge. I don't thonk that you should talk in terms of just fractures. I think that you should talk in terms of trauma to the parts which orthopaedic surgeons are concerned with.

Dr. Ryder: Yes, Al, I agree with that. I think trauma is the area of medical, orthopaedic surgery and fractures is a part of trauma.

Dr. Swanson: And a large part of that is going to be fractures.

Mr. Monahan: Well then let's take up the paper on trauma and go through it step by step.

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*See Appendix I, p. 97.

Defining Categories of Competence

(Per previous suggestions about individual approaches to individual papers and the categorization of content, a procedural discussion ensued. It was then suggested that individuals take their individual papers and work on a categorization for the rest of the afternoon, to return again in the evening and present their conclusions.)

Dr. Brower: I would like to have an example of the task we will be doing this afternoon. Take a fracture, and show me how it would be approached. Take a Colles fracture.

Dr. Edholm: That would be a Category I. You'd expect him to know everything about management.

Dr. Swanson: We spent some time going over group categories in this hand paper that we put out. On page 3, a Colles fracture under this categorization would be Group II.

Dr. Edholm: But you're talking about the physician. You are saying the physician in Group I can do all of this, or the physician in Group II can do all of this. We;re saying that this disorder is in a particular level of competency.

Dr. Ryder: To me all fractures, open and closed, should be Category I disorders to be managed. Every graduate of a training program should be able to handle all fractures, open or closed.

Dr. Swanson: In regard to the hand--we looked at this from society's point of view, from the hospital administrator's point of view. And we also trained some surgeons to do fracture work, which is why we had a Group I. So we made ourselves a Group II, which is what every Board-certified orthopaedist would be.

Dr. Ryder: Well as Curt pointed out, you classified people, and here, we are classifying levels of competence in one person. We have said it many times, that we all function at different levels of competence in different areas of our work. We expect the resident, at graduation from a program, to be at different levels of competency. So we could lump all fractures, all major ligament injuries, all major tendon injuries in the area of trauma. Anything else?

Dr. Swanson: We would leave out certain tendon work for Group III.

Dr. Edholm: Yes, I am not sure I'd put all of the tendons in Group II.

Dr. Ryder: All joint injuries, would you agree?

Dr. Swanson: All joint injuries and all fractures should come under the care of the average orthopaedist.

Dr. Ryder: So all fractures and joint injuries are Category I.

Dr. Edholm: Does that include all ligamentous joint injuries?

Dr. Swanson: I would put the complicated knee in Category III.

Dr. Edholm: If we are going to be turning out orthopaedists who should be handling these, they won't be sending them all to a specialist.

Dr. Swanson: No, but I would like to think that a resident who has just finished my training program and got the triad, would call me for help, and not go running in there to put it together on some important athlete.

Dr. Garrett: Could we separate out athletic injuries?

Dr. Brower: Athletes don't get injured any different than anybody else.

Dr. Swanson: There are people who are specializing in athletic injuries.

Dr. Edholm: But do we want to say that? Do we want to be turning out residents specializing in athletic injuries? What you did in your Category I we are going to do with Hand, Scoliotic--I'll ignore the tumor thing because that is probably separate.

Dr. Swanson: Do you mean to tell me you think everyone should be able to do Scoliosis?

Dr. Edholm: We have two categories, though. You're talking about a third category where everyone has to get rid of a case.

Dr. Swanson: But he doesn't have to get rid of it. We're asking for a minimal competence. In other words, I don't think I could train my residents in the period of time they are expecting, to take care of a triad knee on his own.

Dr. Winter: Because of the complexity of the task?

Dr. Swanson: Right.

Dr. Edholm: Because he's not going to see enough of them?

Dr. Swanson: Right.

Dr. Edholm: Then you're also saying that by the time he's finished being trained, nothing that he has ever done will he ever become competent to do.

Miss McGuire: No, it's the other way around. When he finishes his residency, we're saying he should be at least this competent. Now later, he may become more competent in these areas, or some of your residents may already be competent in the areas we are putting in Category III, but it does not belong in Category I, because you do not expect every resident, at completion of training, to be able to manage it alone. So, in Category I we are going to put only those things which we expect every resident to be completely competent to handle by himself at the end of residency.

Dr. Ryder: That is by our definition of Category I.

Miss McGuire: Right, that is our definition of Category I.

Dr. Ryder: Well, when you start to pinpoint these disorders, it does get a bit hairy, and Al's point is absolutely very good.

Dr. Brower: And if you push Al's point--and it's one that every man has to live with--push it to the end where I wonder if I should do anything with any patient when there is another physician more competent than I.

Dr. Edholm: Or should I improvise when I have never done a thing before--if there is a new procedure prescribed, and I have never seen one or never done one, but I could feel competent in doing it. We all do that, and I am sure the resident in his first year is going to be faced with that problem.

Dr. Olson: Aren't we mixing two different things here? We are mixing the mature, independent, if you will, with the man who is in training, where the ultimate responsibility for the patient does not rest with him. So I wonder if we are not confusing the issue by saying a resident should be able to do these things, which is quite different from a man in his first year out.

Dr. Ryder: The limit of our task is right here--the day the guy graduates from residency--and we are merely specifying what his competence is at that point.

Dr. Swanson: Plus the fact that we don't want to state that this is a legal thing.

Dr. Ryder: That's a pitfall of this whole approach, but we can't be defeated by that either.

Miss McGuire: We are saying at least he should be able to do this, not at most.

Dr. Ryder: Again, recognizing that some will be able to do a great deal more.

Dr. Brower: So in Category I, we are talking about the fact that he should be able to handle all joint injuries and fractures, with the possible exception of complicated knee injuries.

Dr. Winter: We could say with the exception of those we put in Category II.

Dr. Ryder: It might help us now if we could think of some items from trauma we could put in Category III, and give us the outer limits of this thing.

Dr. Garrett: Now we're mixing up two things here. In one category we're saying that he should refer it to somebody outside his category of specialty, and in another, we say he needs help from some sort of mentor.

Dr. Ryder: Category II means "with help," and I will take a gross example here. Treating a Colles fracture should be Category I. Category III procedure would be an open chest injury, he can identify it, and provide immediate care, but he is not the treating doctor for that particular class of trauma.

Dr. Swanson: That's outside of his specialty.

Dr. Ryder: I think our Category III needs re-definition here. Category III, the way we're using it now, means not orthopaedic conditions.

Dr. Swanson: If you want to stick with the knee, Category III would be the reconstructive surgery of Joe Namath's knee. Are we going to have a fourth category? Category III, being the area in which he refers to a specialist within orthopaedics. And Category IV is the ability to recognize, assess the severity of, and refer to someone outside the specialty of orthopaedics. What I would do with that is put down open chest injury as Category I, what I can diagnose, etc., but I don't bother with it.

Dr. Edholm: But that's not all of Category I.

Dr. Winter: Our Category I is where he has the responsibility from start to finish. Category II is where he possibly should share that responsibility. Category III is when you breath easily and go home and have a drink.

Dr. Olson: We could define these categories briefly in this manner: Category I is - recognize, treat and manage. Category II would be recognize, treat, and manage in consultation with: and Category III is merely -- recognize, provide emergency treatment and refer to the appropriate specialists.

Dr. Ryder: My third category was expressed as "work as a member of a total care team to identify orthopaedic aspects and find treatment plans for patients with the following categorical disorders: multiple system traumas, meningomyelocele, cerebral palsy, juvenile arthritis," where the orthopaedist takes part in this but does not take the meningomyelocele patient and treat him all along.

Dr. Edholm: The shared responsibility in Category II could take the form of purely consultation or assisting in procedures, as in the case of lateral possible dislocation, or it could be in the form of a team approach as is myelodysplasia. Those are all three types of sharing. Under treatment you would include just emergency treatments when you recognize and may just want to splint a part and have someone else take care of it, or close the sucking wound with a bandage and call the chest surgeon.

Dr. Swanson: When you start to classify things you have to know for whom you are classifying. Are you classifying it for the Osteo Society, the medical specialty, that is, I think you would have to group the diseases that are orthopaedic, then you have to rule out the vascular injury, then you have to rule out chest problems, and stay with a list of orthopaedic problems.

Miss McGuire: Couldn't we begin, then, to lift out from the area of trauma the things that belong in these three different categories. We have given a lot of instances.

Dr. Huncke: Hasn't this been done by Dr. Parks?

Miss McGuire: All right, then, let's look at Dr. Parks' "Curriculum for Orthopaedic Residents As Applied to Trauma," and see if there is anything we disagree with here if we recast it in this form.

Dr. Winter: Dr. Parks' first category here in this paper belongs with what everyone should be able to do. Fractures, we are agreed. Shall we make some exceptions for some hand surgery and/or some spinal work?

Dr. Swanson: Well, the first thing you have to get rid of is that musculoskeletal term there.

Dr. Brower: Would you buy the loco-motor system?

Miss McGuire: Is what Dr. Parks has under his Roman I what we are putting in Category III?*

Dr. Winters: With certain mentioned exceptions.

Miss McGuire: O.K., then, shall we get the exceptions down? The exceptions under the category of Fractures are as follows: I, skull and face; fractures associated with other spinal injuries go in Category II.

Dr. Winter: You are willing to say he should be okayed and cleared on all spinal column injuries not complicated by insignificant spinal cord injuries?

Miss McGuire: So Category II is all spinal injuries not complicated by spinal cord or--all fractures complicated by vascular neurologic--

Dr. Huncke: Not complicated by other systems injuries.

Dr. Brower: Well, if you have a peripheral nerve injury, do you call a neuro-surgeon in to fix it?

Dr. Edholm: You may call him in for consultation though.

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*The Categories I and III, as discussed in this day's work will be reversed so that the reference above to Dr. Parks' Roman I being in Category III will eventually be Category I.

Dr. Brower: Why?

Dr. Edholm: I usually do for legal protection, at least.

Dr. Winters: Well what do you expect your resident to be able to do at the end of residency? Do you expect him, at least, to be able to perform definitive peripheral nerve repair?

Dr. Brower: Well we see more peripheral nerve injury than neuro-surgeons do.

Dr. Edholm: It certainly varies from place to place.

Dr. Huncke: But you expect your resident to be able to suture a peripheral nerve when he's through.

Dr. Edholm: Yes.

Dr. Winters: With the quality to match the man who is picky, uses a loop?

Dr. Swanson: He should be able to do a standard suture of a nerve.

Dr. Brower: Now, in all fractures, you're talking about Category III, except Dr. Ryder's spinal cord injuries which is Category II. Peripheral vascular, which is Category II.

Dr. Swanson: Why don't we say with complicated neuro-vascular deficits. That allows you to take care of the simple ones, and if you want to [illegible]

Dr. Edholm: Putting it in Category II doesn't mean he can do it. What we mean is he is really going to be looking for some assistance even if its only an opinion.

Dr. Swanson: We want to be careful not to separate categorizing diseases.

Miss McGuire: We're just categorizing diseases for one type of physician.

Dr. Swanson: You first categorize the physician and then categorize the disease and say that that number two physician can handle this disease.

Dr. Ryder: No.

Dr. Huncke: Why try to categorize the residents who are finishing their program at any sort of level. We're talking about one level--the minimum acceptable to turn this guy loose on humanity, so we don't have categorization of physicians.

Dr. Swanson: Well then, they would be all Class II physicians.

Miss McGuire: We're saying what this Board-eligible guy ought to be able to do with diseases, and we are throwing the diseases into categories.

(A long interchange between members of the group followed on the issue of the categorization of physicians and the categorization of diseases. It was finally resolved and agreed upon, that the task of this group was to deal with one type of physician: the orthopaedic resident who has just finished his training and is about to embark upon practice. And in dealing with this one type of physician, the task of the group is to categorize the level of competency he can be expected to have, i.e., those diseases for which he is sufficiently skilled to assume complete and sole management of; those diseases for which he has a skill and knowledge but would probably need assistance from another orthopaedist; and those diseases for which he may be expected to provide emergency treatment only and then refer to others outside of the specialty of orthopaedics).

Miss McGuire: Have we now covered the fracture?

Dr. Edholm: No, one more. What about that severe four-ligament knee injury or certain types of hand fractures? What category should those be in?

Dr. Swanson: I would say that the dislocation of the proximal interphalangeal joint with a palmer fragment is beyond the competence of the Group II physician.

Dr. Edholm: There must be others. Are we going to list them all, or is there some way we can group them? Complicated hand injury is a broad term. What's complicated for me might be simple for you.

Dr. Swanson: We've already said what it should be here in hand. Can I rephrase the question? Take the average orthopaedic resident. What hand injuries should he be able to handle all by himself without any help or consultation from anybody? What we said was most hand trauma, straight forward elective cases, he refers extensive trauma and major reconstructive and elective cases.

Dr. Ryder: We're hung up on this third category. Maybe we need a fourth one. Take osteosarcoma, for instance. The resident at the end of his training should be able to manage osteosarcoma with help.

Dr. Edholm: Right. He should be able to do it. Whether he wants to or not is another thing. Right now we're not talking about whether he wants to.

Dr. Ryder: So, osteosarcoma should be Class II. Well, II or III. Let's see, the essence of Number I is obvious, isn't it? The guy can handle the whole thing. The essence of Number II is a little less clear, but not too unclear. He can manage the thing, and he probably will do it better if he has some help--is that the sort of thing? The essence of Number III has to do with multiple system problems and extremely complex problems in which he is going to be taking a part but not as the only identifiable physician.

Dr. Edholm: If we are going to be using, as a guideline, simple and then complex divisions for hand injuries, we are right back to where we began, what is simple for one man is complex for another.

Dr. Ryder: And what is the minimum level of competency this man should have when he finishes his residency?

Dr. Edholm: We could go through every single injury of the hand and decide whether it's simple or complex.

Dr. Brower: Do you think it would be easier to describe a curriculum? I don't think so.

Dr. Edholm: Well, if we all agree that we can't solve the thing, just say simple and complicated, and let Al work it out.

Dr. Ryder: We're really hung up on only one thing, and that's our third level of competence, because the other two we can identify fairly well and easily peg things in.

Miss McGuire: Well, we've actually done pretty well in getting our one, two, three levels on fractures, we could then plug in here what's been done on hands. Pages up to 8 would all fall in No. I, then the next pages following would all fall in No. II or III, and with things on page 11, maybe, in the III group. Can we do the dislocations, muscles, and tendons the same way?

Dr. Brower: Ligaments and tendons, I would say, but I don't know of any dislocations that anyone sends anywhere else.

Miss McGuire: O.K., so all dislocations -

Dr. Edholm: Well, dislocations excluding the spine would be Category I, some spine dislocations would be Category II.

Miss McGuire: Is there any way that we can describe those that will be -

Dr. Ryder: In general, spinal cord would be excluded.

Dr. Swanson: Irreducible dislocation is a problem.

Dr. Brower: Of the what?

Dr. Swanson: Of the spine, without neurological trauma.

Dr. Edholm: Most of us use a team approach, I don't think any of us manage it alone.

Dr. Brower: Of the lumbar dorsal spine?

Dr. Edholm: Yes. We're talking about a lumbar dorsal dislocation that doesn't necessarily have any neurological complications. I think we can list it two ways. We can say irreducible dislocation of the lumbar dorsal spine without neurological involvement is a Category I, with neurological involvement is a Category II.

Miss McGuire: And all other dislocations are a I.

Dr. Edholm: Right.

Dr. Brower: Wait a minute, what about the cervical spine?

Dr. Edholm: Let's generalize, then, and make it spine.

Miss McGuire: All right, then, all dislocations of the spine without neurological involvement are No. I.

Dr. Ryder: And, of course, we can assemble all fracture dislocations in I.

Miss McGuire: Now what about ligament injuries or has it already been covered in these others?

Dr. Swanson: No, ligament injuries will be separate.

Dr. Winter: Could we break away from those numbers entirely?

Dr. Edholm: What about using solo, share, and refer:

Miss McGuire: All dislocations will be "solo" except dislocations of the spine involving neurological deficit, which will be with help or a "share."

Dr. Brower: We also have to talk about dislocations which have neurovascular problems.

(After a short discussion of cases illustrating problems, it was finally concluded that the statement regarding dislocations would be as follows: All dislocations would be Category I, solo, with the exception of spine dislocations with neurologic involvement and peripheral dislocations with neurovascular involvement which are shared responsibilities).

Dr. Swanson: Well now, the irreducible dislocation doesn't have it yet, so we might add - with existing, or the threat of, neurovascular complications.

Dr. Edholm: A dislocated hip has a threat of neurologic involvement.

Dr. Swanson: But it's not irreducible.

Dr. Edholm: Correct, but it may be. Are we going to tell them, if you get one of those you had better call somebody?

Dr. Garrett: This is where we get off on that thing again. When we have a category in which we say you dan't do it -

Dr. Swanson: We're not saying you can't do it.

(General comments from everyone with regard to the fact that the category does not mean a person cannot manage the case but that he may have to have some assistance in accomplishing it).

Dr. Swanson: I think that in an irreducible fracture dislocation of the hip, he might want some help.

Dr. Brower: But probably only physical.

Dr. Edholm: Well he ought to know what the problem is, and he ought to know what to do about it, and he ought to be able to do it providing he can get enough strong backs and arms to help him. He shouldn't have to call in another orthopaedist. He ought to be able to handle it until there is neurological involvement.

Miss McGuire: Now can we dispose of ligament injuries in the same way?

Dr. Swanson: No, there are simple, and complicated multiple.

Dr. Winter: Are there other exceptions, say, hand and knee, or ankle. Is the technical repair of ankle ligaments--I see no problem in the mechanics of doing a medial collateral ligament repair. It is not unduly difficult, but doing a three or four ligament repair --

(There ensued then a brief interchange about the technical aspects of such repair).

Dr. Brower: So, multiple ligament injuries to the knee would be a "share."

Dr. Huncke: Some of the old chronic ligament injuries--

Dr. Ryder: But that's not in trauma.

Dr. Swanson: And I would say, in the hand there are certain ones like the ulnar collateral ligament of the thumb can be taken care of by a first-year man out of residency.

Dr. Ryder: I'd buy that one, but I wonder a little bit about the knee one.

(After a brief interchange it seemed to be the agreement that significant ligamentus injuries of the hand would be a "shared" responsibility).

Dr. Brower: Now I would agree that tendon injuries is a no-man's land.

Dr. Swanson: The extensor tendons over finger joints are problems. Those are the ones you send to your worst enemy.

Dr. Edholm: But those patients aren't going to go 100 miles away. The first-year man is going to have to be able to handle it in some way.

Dr. Swanson: In hand surgery, you are better off putting him in a splint and sending him.

Dr. Brower: I think what you are talking about here is level of competence and judgment and it's going to have to adjust locally. If a guy had an injury to his eyeball, he would go across the state. And if I really believe that a patient should go 100 miles away, I can twist his arm to get him there.

(A discussion followed regarding the patterns of practice and the tendencies toward group practice which would make available assistance and help among orthopaedists).

Miss McGuire: Now I got lost. What was the decision on tendon injuries?

Dr. Brower: Category I, all tendon injuries except those in no-man's land.

Dr. Ryder: That's the hand.

Dr. Brower: Yes, everybody knows no-man's land.

Dr. Ryder: And those are all "shared."

Dr. Garrett: By putting this "share" on the middle category we are asking for all kinds of wrong interpretations, and if we could label it not to be accounted for, or something, we won't get into any legal implications one way or the other, and we won't get into hassles over it. He is not required to know this in order to be a full-fledged orthopaedist at this point in time.

Dr. Swanson: In trauma, that would be flexor and extensor tendons over joints.

Dr. Winter: And what you are saying is, you don't expect him to do definitive repair of those?

Dr. Swanson: Those in the hand.

Dr. Garrett: I think we should really use the phrase "not accountable for."

Miss McGuire: I think I like the phrase, "not accountable for the definitive care."

Mr. Monahan: Let's consider this resident who has now finished his residency. Are you going to require that he has certain knowledge of these things, or not?

Dr. Edholm: I thought we said that in Category I he must have sufficient knowledge to assume complete responsibility for, diagnosis and management of -

Mr. Monahan: So in Category II he also has to have a certain amount of knowledge.

Dr. Huncke: He could manage it but the fact that he might want to share it is not going to be a no-no.

Dr. Edholm: He must have sufficient knowledge in Category II to partly manage, but may need consultation or a team approach.

Dr. Swanson: I think we must remember why we are asking this of him. We are now in the test situation, it is simply so he can pass the Board, aren't we?

Dr. Huncke: Aren't we saying that the community can reasonably expect this orthopaedist to take care, completely, of this disorder, but no one should be surprised if in other categories he may share responsibilities?

Dr. Swanson: And we are interpreting it for the community.

Dr. Ryder: Let me read these two things, together, instead of trying to rearticulate them. Solo would come out like this: the orthopaedist would independently, accurately evaluate patients, establish a proper diagnosis, devise a treatment plan and, as leader of the operative team, perform the procedures. Shared is - in consultation or collaboration with one or more physicians, establish the diagnosis, identify those patients who need orthopaedic management, define a treatment plan and, in association with one or more experienced orthopaedists or surgeon from another discipline, as appropriate, perform the procedure.

Dr. Garrett: Well the problem here is that we get off on the negative side of that, and we are taking it to mean that he may not do that. But some residents may be able to do this Category II.

Dr. Ryder: Exactly.

Dr. Edholm: But we also know that there are certain diagnoses which are impossible to put into Category I. You can't take myelodysplasia, for example, and ever put it up in Category I.

Dr. Swanson: What do you mean by that?

Dr. Edholm: You can't manage myelodysplasia without a urologist.

Dr. Ryder: So he must work in collaboration with one or more physicians, as appropriate.

Dr. Swanson: Now we need something for a Category III.

Dr. Ryder: Well my III was - work as a member of the total care team to identify orthopaedic aspects.

Dr. Swanson: Well this is still the category of orthopaedics.

Dr. Ryder: Yes, it's to identify patients who have orthopaedic symptoms and not orthopaedic diseases, in getting them to the right guys.

Dr. Huncke: Categories I and II are pretty much treatment categories where III is a diagnostic category.

Dr. Ryder: And so far we haven't hit anything which is a Category III.

Miss McGuire: That's because we have been working on trauma.

Dr. Winter: Is there anything objectionable on the rest of this first page on trauma?

(There isn't any negative response to Dr. Winter's question).

Mr. Monahan: Now that we have done some work on trauma, using the categories that we have finally settled upon, let's break into small groups and take your own and/or another individual paper and do the same thing that we have been doing as a large group with the trauma paper.

(At this time small group assignments were discussed. Individuals selected to meet together with the various components submitted by other authors. A discussion proceeded on the procedure to be used in completing these tasks in small groups).

Dr. Winter: The question on knowledge - what do we do about basic sciences in regard to the categories. Can we just say what we expect them to know and demonstrate knowledge of -

(Reference is made to an itemized list of pathology on the blackboard).

Dr. Ryder: Yes, there are a whole lot of these areas, such as, fluid balance. It is no use for everyone to write fluid balance under trauma, pediatrics, adult, etc., I have a feeling that's tomorrow's work.

Dr. Edholm: Should we have a category, such as, basic patient-management?

Dr. Ryder: Yes, basic sciences, basic patient-management. I am absolutely a rebel in this, but I would like to see basic sciences drop out of the scene entirely.

Dr. Edholm: Yes, I would too, and try to plug it into each of these other areas where it belongs.

Dr. Ryder: For training orthopaedic surgeons--we are training orthopaedic surgeons! If we are training basic scientists, we should be training basic scientists.

Dr. Brower: This is the same problem with the Board before, when they wanted to have the categories of pharmacology. He should know bacteriology, he should know --, and we arguing that it seems as though we are setting up a residency program as a recapitulation of the medical school. And it seems to me that we have to assume that the individual went to medical school.

Dr. Edholm: Yes, that's been de-emphasized again.

Dr. Brower: De-emphasized, again?

Dr. Ryder: As in the latest Board ruling.

Dr. Swanson: Well, what I'm going to do now is to see that the boys who don't get a rotating internship rotate through internal medicine as part of the orthopaedic training program.

Dr. Edholm: If they drop the internships, and residents come in out of medical school, they will have to spend some time on this.

(At this point the group went to its tasks in small clusters to reconvene later Friday evening).

SMALL GROUP REPORTS

Trauma

Dr. Edholm: If we are going to start with trauma, before you go on here, this first page contains some of the notes I took this morning. Some of these numbers then refer to the classifications as we had them earlier in the afternoon. The II's turn out to be II's, either way.

Dr. Swanson: And the Category is I, instead of III.

Dr. Brower: Now, as we understood it, the rest of Dr. Parks' outline here was merely an expansion of that first to six things. So those classifications from this morning hold until you get to Part II of the Cardiopulmonary set on the next page of the original presentation. We didn't like the original classification of rib flail, recognizing that many orthopaedists will see a guy with a closed fracture of the ribs three days later with no acute pulmonary difficulty, and I doubt if he will send him to a chest surgeon. So we assume that that case would be a I. Then, if he has a closed fracture with pulmonary complications, the case would be a III. Then, a flail chest case would be a III. Okay? From there on, we went to pulmonary trauma. (Reading the categorization of Dr. Parks' content). Pneumothorax, II. If in an emergency he has to throw in a chest tube, o.k., but then he will refer it to someone else for continued therapy. Hemothorax, II; Pulmonary contusion, II; Fat embolism, II; Upper airway obstruction, II; Ventilatory insufficiency, II.

Dr. Edholm: Question. Upper airway obstruction, I think it might be well to make two categories, acute and non-acute. The first-year post-graduate man should be able to manage an acute upper airway obstruction because the treatment is the performance of a tracheostomy.

Dr. Brower: Any argument?

(No objections voiced).

Dr. Edholm: So I'm going to suggest a sub-category, acute and not acute.

Dr. Brower: Then you want to put a I after acute?

Dr. Edholm: Yes.

Dr. Brower: Cardiac trauma and cardiac contusion, we put down as III--recognized; Cardiac tamponade, II; Cardiogenic shock, II; Hypovolemic shock, II; Vessel injury--we put down "emergency treatment of," not in the supportive sense.

Dr. Edholm: I realize we are talking about cardiac trauma, but I think this is the only place where hypovolemic shock may appear, and I wouldn't want residents to think that their only contribution was to call for help. If hypovolemic shock is going to occur some other place in the outline, then I would agree with leaving it as a II here. But if it is not going to occur someplace else in an objective outline of an educational program, then it ought to be a I here.

Dr. Swanson: But that isn't the way it is in Dr. Parks' outline. It was hypovolemic shock including acid base balance. Pumping blood into a guy and restoring a blood pressure is one thing, and balancing him out for five days of hypovolemic shock is another thing. And at that time we felt he ought to call for help.

Dr. Brower: I've got major vessel injury as a III, but I can't remember why that crossed my mind. Parks said emergency treatment of a major vessel. That really shouldn't be a III. He certainly recognizes it, but he's not going to shout for help watching it pump. So what he would do, Al, call that a II?

Dr. Swanson: No, we talked about that, and we said if there was laceration, he would fix it. But if a patient needed a graft or a reconstruction with a vein graft, then he could call for help. And that's the diagnosis and refer to Category III.

Dr. Brower: Peripheral vascular problems, major vessel trauma, we made Arterial sutures, II; Arterial grafts, III; Neurologic penetrating head wound we put down as III; Skull fracture is III; Sub-dural hematoma and epidural hematoma is probably a II, assuming that there might be a place where he has no choice and might have to burr.

Dr. Swanson: I think a III, except in an emergency situation. These two in Category II would mean that he would participate in the treatment.

Dr. Brower: O.K., then we will make it a III, except emergencies will be a II.

Dr. Winter: Of course we don't want any lawyer holding him responsible for that ability.

Dr. Brower: Brain stem injury, III. Neck: recognize cervical fracture, yes, including crutchfield tongs--I; cervical fracture dislocation, I; sprain, I; cervical disc, we put down II and III.

Dr. Swanson: If it's central, it's certainly a III; if it's lateral, you might fiddle around with it.

Dr. Edholm: Dr. Garrett and I thought that the application of crutchfield tongs might not be universally taught.

Dr. Brower: That's correct.

Dr. Edholm: And are we going to state, in this document, what is done or what ought to be done?

Dr. Huncke: Just strike out the crutchfield.

Dr. Brower: Well there are some people who put in their own tongs and some who do not.

Dr. Garrett: Is it expected of every resident finishing his residency that he should be able to do it?

Dr. Swanson: He damned well better be able to do it.

Dr. Ryder: It's a value judgment, but I think that every resident ought to be able to do it.

Dr. Garrett: I think this will change the number of residencies doing it.

Dr. Swanson: You're against it?

Dr. Garrett: No.

Dr. Edholm: Are there programs for example, where all cervical injuries are admitted to a neurosurgical service, and the orthopaedist sees them only in consultation?

Dr. Winter: Yes.

Dr. Edholm: If we write this down as a criteria that every resident should know, are we being realistic about it?

Dr. Swanson: I think the orthopaedic surgeons in this country, when they go out into practice, will be required in a large number of situations to be responsible for cervical spine injuries which have no neurological deficit; therefore, that resident had better know how to treat them.

Dr. Edholm: I agree with you.

Dr. Brower: The reason we had a dissertation on disc was that we didn't know how to answer it. Some orthopaedists in my town do their own disc surgery. There are some guys who don't. I don't know where to put it. Most of the recent discussions and papers have been done by orthopaedists. So we put down II and III.

Dr. Swanson: Out point was that when you have tract signs, you need a certain neurosurgeon, that's why we put it in III. The lateral disc may very well be done by the orthopaedists.

Dr. Huncke: Maybe Category II would be the best one to cover that. He should have enough knowledge of the principles so that if he is in an area where orthopaedists do it, then conceivably he can.

Dr. Swanson: There are some areas where orthopaedists do not do it, so, since Category III means to diagnose and refer, you can categorize it that way.

Dr. Winter: But you would not really be willing to concede that whole area to another specialty.

Dr. Swanson: By II and III we don't.

Dr. Edholm: If we say II, we leave it open either way, he can manage with consultation. But a III sort of precludes his ability. If we put a disorder in Category III, we are saying that a resident who finishes need not know any more about it than enough to make the diagnosis. And if we are saying that it is a disorder which goes under Category II, we give him some leeway in managing with help, consultation, or whatever, but we don't exclude him from doing it.

Dr. Swanson: In this instance we are testing him for his competence. We're talking about whether he should do it by the Board, and I don't think we should examine a patient with a central cervical disc protrusion with tract signs and expect the resident to know how to do it.

Dr. Edholm: That still allows it under II.

Dr. Swanson: That's with help. Treatment with help. We don't expect him to know how to treat it without help.

Dr. Brower: Cord damage compression is III. Vertical nerve injury we put down as II. Gastro-intestinal injury, all those are III's. Urologic system we put down as II.

Dr. Garrett: You mean, if there is a cervical cord compression, you shouldn't have anything to do with it except to know it's there?

Dr. Swanson: He should be able to diagnose on the examination and that's all.

Dr. Garrett: Well, I think he ought to be in there with it.

Dr. Swanson: You're talking about acute, and that's a whole different ball game. Most central cervical cord compressions are chronic.

Dr. Ryder: It seems that we did a little better on this earlier when we said fracture dislocation without cord damage or complications is I; dislocation with cord complication is II.

Dr. Edholm: He's not talking about boney injury under this category of trauma. Under Roman IV, he is talking about neurologic trauma and not neurologic trauma associated with oseos trauma.

Dr. Swanson: Let's define what we mean by calling for help. Does that simply mean a first-year orthopaedist will take a patient up to the operating room, do the surgery, and call for help?

Dr. Brower: Well I was thinking about some injury in which he is called to see the patient and in the examination noticed that there is cord compression. He should have enough intelligence then to recognize it and call for help.

Dr. Swanson: Which means that he diagnoses it and refers it.

Dr. Garrett: If you are talking about fracture dislocations, you need to make sure that there is a stable cervical spine and if it's not a fracture dislocation--the only one that I'm arguing for the involvement of the orthopaedist is a fracture dislocation.

Dr. Swanson: But we are talking about cervical disc.

Dr. Garrett: Well, it isn't distinguished that way in the outline. Maybe we should put cord in there.

Dr. Brower: That's right, it's not. He's talking about neck, cervical fractures, etc., and then he talks about cord. I will admit that right now I could not tell whether he means Part C still relates to Part B, and whether we are talking about cord compression anywhere.

Dr. Garrett: Well I assume that the first group was without neurologic damage, and the second is with cord damage from any of those things.

Dr. Brower: Well let's put down cervical cord.

Dr. Garrett: Do you want to put cord compression with fracture dislocation? Then it's with us. I think we have a hang-up here because we are following an outline on trauma. Roman I of the outline is with the musculoskeletal system. Each other Roman numeral is a different system of trauma. He is not connecting one system to the next, and we are talking about the neurologic system under Roman IV. He simply states in here, cord compression period. Now if it's just cord compression, and he is not associating it in this outline with oseos injury, then I think it should be number III. Now if we want to revise this outline and put in cord compression with oseos injury, then we can change categories.

Dr. Brower: Would it help if we put cord compression without oseos injury?

Dr. Garrett: We could even take this whole thing out. The whole category is neurologic, and he's listed various causes of it and we have already categorized. Just throw out this thing about cord!

Dr. Brower: Peripheral nerve injury, II. Does that hurt anybody?

Dr. Edholm: As a blanket statement? We don't expect him to be able to manage any peripheral nerve injury?

Dr. Brower: II means that he will diagnose and manage and call for help if he needs it.

(After a brief discussion, the determination is made that peripheral nerve injury category will be I and II).

Dr. Brower: That wasn't difficult. Now we get down to the genito-urinary system. We discussed the fact that in some places the orthopaedic surgeon, seeing pelvic trauma, will do the insertion of the cap to performance of the cystogram IVP. Now do you think we should put that down as a II?

(Agreement is expressed).

Dr. Brower: Well that's what I have. We did not discuss at too great an interval the basic science problem. As you recall some years ago to help us, the Academy sent a fantastic accumulation of materials stacked that high, which was supposed to help us teach basic science. Which didn't help me a whole hell of a lot. But I guess, if we really wanted to push for this thing, we might, somehow, summarize the Academy material and say we believe in it, but how can we categorize it? I don't know. To tell someone there is some basic science, you don't have to know about, is pretty presumptuous, and to say he has to know it all is ridiculous.

Dr. Edholm: The funny thing about it is that we started a year ago by saying that the Essential Component easiest to define would be those in the basic sciences.

Dr. Swanson: We rather agreed that both basic science papers we had are good. Our point was that everybody should be exposed to everything that is presented in these two papers during some time of his education, not necessarily medical.

Dr. Brower: And to categorize it into the competency categories we have determined seems ridiculous.

Rehabilitation

Dr. Edholm: May I suggest that you turn to the middle of this handout on Rehab., what would be the third page. We wrote a new Roman numeral I, it should read "Physical Evaluation." Under A, Range of Motion; B, Muscle Testing; C, Gate Analysis; D, Knowledge of Electro-diagnosis (and that's knowledge, not ability to do); E, Evaluation of Functional Impairment. All of those would be in Category I. Then going to the original outline of Essential Elements, we will re-title it "Essential Elements of the Physica Aspects of Orthopaedics." The first section would be Plaster Casts and Splints, Types and Techniques of Application, Immobilization. On the original there is a long list of types of immobilization which are all in Category I. The Types of Corrective Casts: Club Foot, Stretching, and Wedging Casts would be Category I. Then Milwaukee, Mobile Risser Casts, and Risser Casts would be Category II. Then, Materials for Use in Plaster Casting, including the types of casting and the types of padding, and Control of Temperatures, etc., would all be Category I. The Uses of A Fracture Table would be Category I. The next heading under Traction - Purposes, Types of Materials for Traction, and the Types of Traction, are all Category I. And we had said here, in our discussion, that, maybe, Vinke and Crutchfield Tongs should be accepted because, in all areas, they are not used, but we have reversed that here, in regard to the statement that all types of traction are Category I, and that would include Skeletal skull traction. Under Orthotics, as listed in the original outline, Purposes, Component Parts, etc., Types of Bracing, will all be Category I. This agreed? The original outline on Orthotics consisted of Purposes of Bracing, Static and Dynamic, Component Parts of Bracing, Short-leg Types of Braces, Long-leg Types of Braces, Pelvic and Trunk Attachments, Back Braces, Crutch Types, Wheel-chair Types, Beds, Proper positioning in beds, Turning Frame, Blanket Frames, those are all listed under Orthotics.

Dr. Garrett: I think Upper Extremity Bracing ought to be Category II.

Dr. Swanson: I agree, I think I do more teaching on that than on anything else.

Dr. Edholm: I don't happen to have Upper Extremity Bracing listed on Orthotics.

Dr. Brower: Why do you say Category II, Al?

Dr. Swanson: Because residents don't seem to understand Upper Extremity Bracing. We had to do more teaching about that than anything. In Hand Surgery everyone wants to do the surgery, but they don't want to do the brace.

Dr. Edholm: O.K., then, so Upper Extremity Bracing should be Category II.

Dr. Garrett: Well you cannot expect all residents to know it.

Dr. Swanson: Then I or II. Power Upper Extremity Bracing is definitely not a Category I, but the usual Warm Springs Brace--I had hoped that everyone would know that.

Dr. Edholm: One would expect that he'd at least be able to ask for help.

Dr. Swanson: Well we don't necessarily expect him to ask for help. Isn't that what II means?

Dr. Edholm: Anything, other than III, he may be able to manage by himself, although he may need some assistance.

Dr. Garrett: I don't get this I and II.

Dr. Swanson: That would be necessary unless Dr. Edholm is going to divide up these Braces, but, as the list stands now, braces are not divided. We would have to go through a whole long list.

Dr. Garrett: I don't know of any type of bracing that is standard throughout the country.

Dr. Ryder: What specific types of Upper Extremity Braces should the guy be able to order, evaluate, etc., independently?

Dr. Swanson: He ought to be able to order a brace for a wrist drop, for a high or low radial.

Dr. Edholm: You can make it broader and say whether it will be static splints or dynamic splints.

Dr. Swanson: Let's make it II.

Dr. Edholm: The next item, Prosthetics, we now have a Roman V in the outline. In the category of Upper, all, with the exception of the juvenile amputee, which is listed as arabic 8. Juvenile amputee management should not be Category I but Category II, and if we change the wording in arabic 9 and 10 to "Knowledge of Congenital Classification and Knowledge of Fabrication Methods," then the entire rest of that can be Category I. Under Lower Extremities, almost the same thing; all are Category I with the exception of Juvenile Management which becomes Category II. Then Knowledge under arabic 10--Congenital Classifications--is Category I. Are you objecting to Juvenile Management being Category II?

Dr. Swanson: No, to "classification; because there is an International argument about classification right now.

(After a discussion regarding the problems of classification, it was noted that in the outline, Congenital Classification should be changed to read - Amputee Classifications).

Dr. Edholm: Will this item on Classification get in some place else?

Dr. Swanson: Well there is International disagreement on it, and it's changing now.

Dr. Edholm: But residents are being examined on it.

Dr. Swanson: Well, then, the examination should be thrown out.

Dr. Edholm: All right, then, we'll just throw out these classifications from the paper.

Dr. Edholm: Roman VI, as originally written, said Therapy Techniques: cold, ultra-violet, massage, exercises, posture, and body mechanics, aids, mat, parallel bars --

Dr. Swanson: What did you do with the EMG?

Dr. Edholm: We listed that under Knowledge of Electric-Diagnosis and put it down as a I, i.e., just the knowledge of, not including the skills. So this Roman VI, Knowledge of Physical Modalities is a very broad area. Roman VII: Knowledge of and Ability to Instruct in Terapeutic Exercises and Ambulatory Aids, this is all Category I. Roman VIII: Ability to Work as a Leader or a Member of a Team of Physicians and/or Nurses, Allied Health Personnel and Behavioral Scientists, Category I.

Dr. Brower: And you are able to measure that and teach that?

Dr. Edholm: We didn't decide to do that. We need that statement in there because some of these specialties do not feel that we have direct access to the services. There should be some statement recognizing the team approach to the care of complicated problems. We had to indicate that our finishing residents have the ability to work with other people, technicians, therapists, etc.

Dr. Garrett: Note on page 1 of this thing, where disabilities are discussed as entities in themselves. A spinal cord injury, in itself, is a Category II item, but in Disabilities there are several that are I, and this is the Emergency Care as listed, which is the evaluation of associated injuries and the treatment of the orthopaedic injuries. II is Order and Interpretative Appropriate X-rays of the Vertebral Injuries and Plan Appropriate Treatment. B, (under that) Stability of the Spine; plan appropriate treatment, etc., we listed that as Category II. Under Complications of Pressure Areas and Contractors, we listed as I, all the others we listed as II; the Functional Training was listed as I, the others, as involving ball and ladder program, as II. Category E and F, as is, are both I. Meningomyelocele, as a disease entity, is listed as II. With the exception in Category I of Knowledge of Indications for Neurosurgery in the New-born. Also as I are Treatment of Fractures, Hip Dislocations and Contractions, but Scoliosis as II, to be consistent with our other categories of Scoliosis. Stroke and Progressive Neuro-muscular Diseases are all II's. In fact, every one of the disease entities is listed as a II because it is a team approach. But we picked out certain categories and will just give you the I's. Under Cerebral Palsy, I is Evaluate motor and sensory defects. Plan appropriate program of therapy, Bracing and surgery, II. Head injuries is listed as II, except the involvement and acute care which is I. Arthritis is a II, but the sub-items as listed are I's.

Dr. Edholm: Under Head Injuries, Prevention of Complications, Pressure Sores and Contractures, are I's.

Dr. Garrett: And the Amputee items, as listed on this page, are all I's. And the Degenerative Neuro-muscular Disease is all III, because not enough residents are usually involved in these.

Medical-Legal

Dr. Huncke: This paper is a little different and, therefore, I have already written the categories of competence to deal with the Essential Components of medical-legal aspects of orthopaedic surgery. I modified extensively Dr. Ware's paper.

Dr. Edholm: I would almost say everything here ought to be I.

Dr. Huncke: Category I, except, for example, the matter of records. Patient records are No. I, involving the matter of confidentiality. As far as tax records go, I think any Doctor who tries to do his own is out of his head.

Dr. Ryder: These are certainly excellent guide lines for the practicing orthopaedist. Whether or not they are components of training, is another question. If they are, how on earth are we going to teach them?

Dr. Brower: You have a resident sit in on your own depositions.

Dr. Olson: There is at least one training program in which residents are assigned for a period of six weeks to a legal rotation, and they spend their time with lawyers and insurance company people.

Mr. Monahan: Dr. Ware was a long time in putting this component out because of that very question regarding the teaching of this category. Some of the things he finally suggested was the legal rotation, sitting in on the attending's deposition, going to court, certain similation situations where, at various times, he is put on the stand and given the grilling he might experience, just so he knows at least what it feels like, and understands some of the preparation that would be necessary for giving testimony.

Dr. Ryder: When you think of the delivery of medical care in the very broad sense, this is a very real problem.

Dr. Huncke: As we said before, one of the things that an orthopaedic surgeon does a lot of is treat fractures, and many fracture cases end up in litigation.

(Discussion which followed consisted of justification for the inclusion in a resident's education of medical-legal instruction, which, it was suggested, is as necessary to fair legal behavior and relationships with patients as is the basic science to the understanding of disease processes).

Dr. Garrett: I don't think any of us have any disagreement regarding the need for it. It's just whether or not it should be stated as an Essential Component.

Dr. Swanson: I would vote for it as an Essential Component.

Dr. Edholm: I think it's an essential, at least from the standpoint that the orthopaedist has to know what he can say regarding his patient, that certain information is confidential and cannot be released without permission. And that's a bare minimum.

Dr. Garrett: You have to have the teaching program available to the resident before you can require it.

Dr. Swanson: Some time the teaching will come after the requirement is made.

Dr. Edholm: I think most of us do this anyway. We don't do it in a concentrated time, though. We do it bit by bit as problems tend to arise. We cover, perhaps, about 50% of what's in the outline.

Dr. Ryder: Well when this statement of essential components gets promulgated upon the waiting world, we might just have a 900-page volume, and somewhere in that 900 pages it should be stated that it is realized that not all training programs can implement immediately the training that is recommended in these Essential Components.

Adult Reconstruction

Dr. Edholm: Under that very first category, "all conditions representing residuals of trauma," etc., I can't buy that as being Category I. Because I am sure there are certain reconstructive procedures in Hand, again, that we do not expect every resident to do.

Dr. Swanson: But he said with certain exceptions.

Dr. Winter: You'll find a late disclaimer here. The problem I'm trying to deal with here is something like total hip in the last five years. A whole group of procedures. I don't know what to do about procedures which are major but not difficult for someone to figure out by himself for the first time.

Dr. Edholm: Would it be legitimate and acceptable to introduce the idea of orthopaedic sub-specialty?

Dr. Swanson: We've already done that to the Hand if that's what you mean. You could refer to category such-and-such under specialty such-and-such.

Mr. Monahan: In other words there will be cross-references.

Dr. Brower: Of course in my area, the resident will usually finish having done two or three hind-quarter amputations. Now, if the faculty in a private hospital would never think of doing this, I don't know if you could put down a requirement that the resident has to be able to do this. So I think you have to leave some of this stuff logical. I think it's pretty well stated here.

Dr. Winter: Refer to point 4 here. There might be some question you're going to raise about it.

Dr. Swanson: I think that you could almost say that the infrequently seen reconstruction problem is a cause for consultation.

(The fifth point of Dr. Winter's Adult Reconstruction Category I was determined finally as a Category II).

Dr. Ryder: Number 6 might be literarily made easier by splitting off the exceptions, and saying with the exception of Category II for point number 3, and we'll make a cross-reference to that.

Dr. Winter: What about number 7 now?

Dr. Brower: What's that word cut off at the bottom?

Dr. Winter: Number - bursitis.

Dr. Swanson: Total management of osteoporosis.

Dr. Winter: That's open to question. Do you want to make that a II?

Dr. Huncke: There have been several million dollars spent on trying to decide what medications should be used for osteoporosis.

Dr. Brower: I would leave it as a I, but admit that most orthopaedic surgeons don't mess with it. But to demand of a resident that he be knowledgeable enough to do this is simple logic.

Dr. Swanson: There are many conditions in degenerative arthritis that require very expert surgery. The reconstruction of joints - the average finishing resident can't be expected to do that. I think we should say here, with the exception of technically difficult reconstructive procedures.

Dr. Brower: O.K., let's put the exception in then.

(Osteoporosis on Dr. Winter's paper is here marked as Category II).

Dr. Winter: Avascular necrosis of bone, osteogenesis imperfecta, should be a Category II and certainly Paget's disease.

Dr. Ryder: I think, in an adult, osteogenesis imperfecta should probably be a I, because it's just trauma.

Dr. Swanson: I think you could cover a lot of this in reconstructive by saying that unusual requirements could be the exception. In all these categories including malignant tumors of the mesenchyme, you might get a massive resection of an extremity like Dr. Femister used to do. Certainly not something some kid can do.

Dr. Brower: I don't understand this last point, "all malignant tumors of the mesenchyme whose surgical approaches do not involve oblation of entire extremity function." Oh, I see, you're talking about local dissections.

Dr. Winter: I don't think your new graduate is going to expect solo responsibility doing hind-quarters.

Dr. Brower: Well, how about the resection of a large tumor with replacement by a cadaver graft or something like that. The average Joe isn't going to take that.

Dr. Winter: We've already said that I've got a built-in statement of exceptions. Now in Category II, we were talking about the shared level. That's what that word is. I think you do get involved with a number of conditions that do have orthopaedic aspects. Scoliosis, though, we have agreed, is almost a sub-specialty. Take Item 4, though, invertebral disc disease. There might be some more argument to say about that as Category II.

Dr. Edholm: Well, I would put it in both categories. I'm sure there are some places where, throughout the entire program. residents are exposed to a tremendous amount of discs; there are other programs where they may have a small concentrated involvement with disc surgery, and they are not required to perform themselves. I don't think you'll be able to say that in such a short time you can expect anyone to be competent to handle all kinds of discs.

Dr. Garrett: I think we'll have to divide this --

Dr. Ryder: No, I don't think so, because these categories have upper compatibility. In other words, putting this in number II says that he is able, with help, to care for intervertebral disc disease. That does not say that he is also able, without help, to take care of them.

Dr. Garrett: Well, if you put this in the Category II, it's because we don't want to require it.

Dr. Ryder: No, this is a minimal requirement. We expect him to be able to handle invertebral disc disease with help. That doesn't say that he can't be brought to the level where he could handle it without help.

Dr. Huncke: Well, you've got to take it out of Category I, if you're going to leave it in Category II.

Dr. Garrett: We keep turning it around and saying he's not supposed to, and that's what's so bad about this Category II. I think it should be written into an introduction to make it clear that the things in Category II are not prohibited as things an orthopaedist could do.

Dr. Swanson: I think this is a very important thing to put down that we feel it is a minimum requirement for examination, but doesn't necessarily mean that they might not, in certain areas, do any of Category II as a Category I.

Mr. Monahan: I was thinking that tomorrow morning, when these documents are pretty well completed, we might have some time to discuss these points that should go into a Forward or Introduction.

Dr. Edholm: I would like to say, for example, that we should make it clear, that we are not writing for examination. At the present time we are writing for our own guide lines as far as the writing of training programs.

Children's

Dr. Ryder: O.K., are we now up to children's? I just listed things that were in the original paper in Categories I and II and I added a Category III.

(There were no exceptions taken to Dr. Ryder's paper).

Dr. Ryder: Jim, can I make some sort of a summary statement at this time? It seems like what we've done here is a great deal of value judgmenting along the way. It has been a tremendous accomplishment and I think there is a huge literary endeavor now to be done and we should think in terms of who's going to write this, turning it into a uniform style, etc.

The Friday Session

Mr. Monahan: As we ended last night, we were ten characters in search of an author.

Dr. Ryder: This is the sort of thing I would like to do, the assembly of this thing, cutting out the overlapping material, and Dr. Garrett at my request has kindly consented to help. But we would need at least 3 months to get it done. I couldn't touch it for at least another 6 weeks. What we propose to do is just the assembling job, coming up with a draft and then recirculate for your comments, corrections and criticisms.

Mr. Bligh: We can provide you with the full transcript of the tapes.

Dr. Olson: I'd be glad to assist you, Charlie, on this if you need the help.

Dr. Ryder: The way I see our situation at the moment is that several aspects of orthopaedic residency education have been covered- clinical orthopaedics, medico-legal business, rehabilitation measures- but we have not yet touched on the sort of general mechanism of patient management, i.e., pre- and post- operative care, fluid balance, and we have not touched the area of "basic science", the patient physiology and the patient pathology aspects. These are the areas that I think we should address ourselves to today, and my proposal would be to take all the materials developed yesterday plus whatever we develop in these other as-yet-untouched areas and try to assemble one document.

Dr. Brower: I was thinking last night, too, about what in the world all this is going to mean. I would say that in the last few years I have received a stack of things from very well meaning committees to help me in teaching residents. Some are very well done, but if I recall how often I have referred to them, I would say it was extremely rare.

Dr. Swanson: I will speak in defense of this document, there is a great need for a curriculum. Many years ago Ted Fox made up a manual for orthopaedic residents which is practically unavailable now, and in it were tips on how to examine a patient, etc. I would like to see a similar manual which has the scope of orthopaedics in it for a resident, starting right out with what is orthopaedic surgery, a brief historical overview of the kind that was in test manuals. I feel that this committee should be responsible for a letter to the executive committee that that committee should be responsible for seeing that this report does not die as so many others have, I feel very strongly about this work more so than I have about some other things I have been involved in. I feel this is very important and I feel that the Board and the Academy have a tremendous responsibility to this curriculum: I personally would write that letter if it comes to that.

Dr. Ryder: Two of the standing committees of the Academy, the Handicapped Child Committee and the Adult Orthopaedics are both battering around in this same area, and of course the education committee. I went to the Handicapped Child Committee as a resource person in April, and what they really wanted to know was what we had accomplished because they are sort of groping and grasping. Somebody is going to be doing this sort of thing and I think that there is enough investment of thought and energy from this group that there is a great deal of sense in our integrating it and perhaps giving cohesion and direction to the work that is going on in some of these other committees.

Dr. Edholm: As I recall a year ago, the original idea about the essential components was to begin with programming material, but before we could program anything, we would have to decide what is essential. I don't think we want to lose site of the origin of this job we are doing here. The programming aspect of it did send out a loose leaf type notebook- the training Chief's manual- which had in it all of the things that Al mentioned, including a bibliography, a list of slide sound materials. The Graduate Education Committee is trying to update it, and I think we may have it available for examination around winter time. So, I agree there are many groups doing this sort of thing and I don't know who is going to tie it all together so we don't have reports coming from a lot of different sources.

Dr. Olson: I think we have got to be cautious here. We are not trying to develop a curriculum. We are saying that these are the things an indivdual should be able to do in order to be considered an orthopaedic surgeon. How a program sequences its activities, what activities it does have as learning experiences, etc. are not within the perview of this committee.

Dr. Edholm: Then it would probably not be good to use such terms as "core curriculum" or even the term "curriculum."

Dr. Olson: That's why we shifted the title to "essential components."

Mr. Monahan: I rather like the comment someone made yesterday that this should be titled "Essential Components of Competency". That term gets us away altogether from curriculum and focuses on the abilities of a resident at the end of a training program.

Dr. Huncke: I think we should make it clear in some introductory statement that this is not a curriculum. This should be used at most as a guide. Some programs are going to be able to go far beyond what we suggest here because of their particular resources. I am also wondering that, since there are a number of other committees, as was suggested, engaged in this kind of work, at some other meeting place we could get representatives of these committees together so that there wouldn't be such redundancy.

Dr. Ryder: Well that sort of thing may have to be done within the Academy structure.

Dr. Brower: I think we should approach all of this on the basis of Mager's Principles of Adult Education (Note: We should get that reference here on Mager's book.) Give to a resident then those manuals that Al was speaking of and also a copy of the Essential Components of Competence and say to him alright these are the things you will have to know when you are finished. This is in keeping with Mager because Mager says you give the adult some concept of the scope of his task, and he is better prepared in going about accomplishing it. So we should aim this material not for the desk of the chief but for the resident.

Dr. Ryder: Yes what we would hope then is that the resident would come to the chief with this in his hand and say "look, I'm supposed to have a competency in a particular area, and I haven't had any experience with it yet; I need some experience with it.

Dr. Brower: Now you've got adult education. The resident is coming in with his worries and his needs, and we say, o.k. let's see what we can work out for you.

Dr. Swanson: Well I think everyone agrees then that curriculum is a dead word. I don't.

Dr. Brower: I happen to have another problem being on the Curriculum Committee of a medical school. There is no such thing in existence in the United States as a curriculum of a medical school. You cannot get a curriculum of a medical school in the United States. They can give you outlines of Joe Blow's coverage but you can't find anywhere the material covered in a medical school and I think that is the greatest need at this moment in the United States-

Dr. Swanson: We say scope of the curriculum here. I think that's important.

Dr. Edholm: The word scope gives you two dimensions at least. It gives you a beginning and an end, and we want to avoid that. We didn't want to call it minimum so we used the word essential to give some inference that these were the least amounts of what people should know. It's left open-ended. If we use the word scope someone could very easily say this is the package.

Dr. Swanson: That isn't what that word means to me. Scope doesn't necessarily mean that that is the limitation. To me it suggests a broad outline--the breadth of the thing.

Mr. Monahan: Well technically speaking we do not have a curriculum in our document here. We are spelling out general objectives for orthopaedic residencies. From these there would be derived statements of instructional objectives. From those come the patterns of instruction, i.e., what the learning experiences are to be and how they should be organized. From the level of instructional objectives through what I've just said becomes the responsibility of the chiefs of training programs and not necessarily that of this committee. Our work here is actually the beginning of a curriculum.

Dr. Ryder: Then we are saying that in order for a resident to have the abilities that we state here, the training chief should establish a curriculum which will provide the resident with the training experiences or-what's that new word- learning environment in which he will be able to acquire these abilities which we feel are the essential components of competency.

Mr. Monahan: There has been expressed around the country to us in visits to the experimental program the need for some kind of manual which can be given to the residents outlining for them the scope- however that's defined- of orthopaedics.

Dr. Swanson: Well if you don't publish this thing I'm going to.

(Dr. Peterson from the Mayo Clinic joined the group at this time.)

Discussion of Attitudes

Dr. Edholm: Can I ask a question now? Aside from what we have to do this morning in a couple more areas, should we try to get more deeply into attitude definition? Is this a profitable thing we could spend our time on? Will we just be spinning our wheels, producing something that will look like gobbledygook to someone else?

Dr. Ryder: My answer is yes.

Dr. Brower: Yes, it will be valuable, or yes, it will be gobbledygook?

Dr. Ryder: Both.

Dr. Brower: Why the hell should we get into it then?

Dr. Ryder: I think perhaps we should limit ourselves to cognitive and implied psychomotor domain. Not to minimize the importance of attitude development, though.

Dr. Edholm: When I raised this question I wasn't thinking just of the attitude toward the patient alone. I was thinking also of the type of things you might want to see develop in a resident such as sound ability to read critically, to decide whether or not an article is a good one or bad one and if so why. We do do things anyway to see that they do read, such as journal clubs. We should do something about their own attitudes toward their own medical staff. These are the things that are picked up almost by osmosis, but I don't think we really sit down and decide in what areas we really are trying to affect things or sit down to ask if we are really actively accomplishing them.

Dr. Brower: Your point about reading is not what I call attitude. That's a scientific method.

Dr. Edholm: I would think of it as an attitude.

Dr. Winter: Are we talking about the kind of thing that's stated here in this internal medicine paper. An attitude is a statement of what someone will do when you're not around.

Dr. Ryder: Well, Curt, actually what you're talking about are cognitive manifestations rather than attitudes in the sense of these platitudinous things here in the Hiss/Vanselow statement.

Dr. Winter: If a patient knows his doctor cares about getting him better, the doctor doesn't have to be a friend.

Mr. Monahan: The point here is not one of developing the resident into a humanitarian. The attitude that we have been referring to is actually the caring. Whether he demonstrates it gruffly, smoothly, nicely, or whatever, the point is that he is demonstrating the attitude. The physician should not be influenced in his treatment by the economic condition of the patient, i.e., a blue collar worker should not get any different kind of treatment or consideration than a white collar worker. If referrals are made to other specialities, such as psychiatry, the white collar worker and the blue collar worker should get the same explanation and justification for that referral. There should not be an explanation given to the white collar worker while the blue collar worker is simply told to go see a psychiatrist.

Dr. Brower: Oh come on! In the first place someone has replaced the worship of God with the worship of comprehensive medical care.

Mr. Monahan: I'm not building a case for comprehensive medical care.

Dr. Brower: Secondly, no one has been able to define to me yet what comprehensive care is. Third, I see nothing wrong with episodic care. If I see a guy who has broken his leg at 20, I fix it, he goes away and never sees another physician until he catches pneumonia at 35 and somebody gives him a shot and he gets cured and he goes back and takes care of his family. That is not bad care. That is optimal and if I have to worry about him every day, saying oh how are you doing laddy boy? That's bull shit. You're going to emasculate males and ruin females. I'm opposed to it. I'm opposed to comprehensive medical care as far as I have heard it.

Mr. Monahan: Well, I'm not going to define it for you nor try to encourage it, nor suggest that every case must involve the pampering of the individual.

Dr. Brower: And the other thing you're talking about is the different type of patients. Take for example a stupid diabetic. There is nothing more incompatible than diabetes stupidity. If the guy has diabetes and is stupid, you can't treat him. You can sit there with him and tell him that diabetes is a difficulty with carbohydrate metabolism, but he doesn't know what you're talking about, and you can't translate it. You can tell him you have got to take these shots everyday. Then he comes back in diabetic shock, and you ask him why he didn't take the shots and he says he felt so good he didn't think he needed it any more and you're going to tell me that there's no difference between a white collar and an illiterate?

Mr. Monahan: But you are stating a difference that is a difference in fact. You have a person you are treating who happens to be a stupid person.

Dr. Brower: You are trying to define in sharp terms the thing that we don't like to talk about particularly, that is the art of medicine. I tend to be a gabby guy and figure that I waste half my time with patients. I have experienced two types of patients, those who want to know about their disease and treatment and those who don't want to know and there are some patients who will just take the authoritarian statement of the physician and be satisfied.

Dr. Swanson: I found a tendency that those patients who call you by your first name and don't know you too well are the kind who never pay their bill and never follow your treatment.

Dr. Garrett: Well I think we could go on for hours on this subject and perhaps we ought to drop it. There are deficits in this area.

Dr. Brower: I can't find a definition of attitude in what anybody is talking about.

Dr. Edholm: Well I brought the subject up. Really it's synonym for what Bloom was trying to get at in the Taxonomy of the Affective Domain. I was trying to approach that aspect of it and I'm sorry I opened a can of worms. But let me say one more thing, and then I'll shut up about this. You do practice comprehensive medicine. I agree that everyone does not need comprehensive health care. As an orthpaedist you do not ignore or drop any other symptoms that may be presented. Granted you're not going to treat it, but you don't ignore it. You encourage or refer them to have these things taken care of by someone else, but unfortunately this episodic care in out-patient clinic may just consist of a physician investigating back pain, giving a patient a pill and telling him to take that and doing nothing more about any other complaints.

Dr. Brower: Well that concern and referral that you mentioned is what I would just call medical care.

Discussion of Other Components

Dr. Ryder: Well, in getting back to our task and the category of basic patient management, I have listed down a couple of things: pre and post operative routine- these are aspects of patient management that apply across the board, not related to children, or trauma or adult but they are abilities the resident should have as part of his basic components. Fluid balance, emergency measures, and I had put rehabilitiation in physical measures in here. This is an overlap of what we had done yesterday.

Dr. Huncke: I don't know if this goes under patient management, but in my practice it always seems that it helps if you know a little about x-ray mechanics because sometimes you want something and the radiologist isn't around to help you. Knowing a little bit, you can tell your technician this is what we want to do, and this is why, and there is a manual you can go to.

Dr. Ryder: Well, Brian, I had that as a separate aspect, special clinical evaluation techniques, which was radiographic and electrical.

Dr. Huncke: Yes, particularly if you get a technician who tells you it can't be done and you have the knowledge to know that it can be done.

Dr. Ryder: Yes, but it strikes me that these aspects do not fall under basic patient management.

Dr. Huncke: Right.

Dr. Ryder: We haven't worked on this, but if we stick to our objectives--writing format, and we write Gronlund-type for pre-and post-operative routines, the obvious easiest one is, "he shall understand how to prepare for pre- and post-operative orders for his patients."

Dr. Brower: I'm sorry, did we throw out Mager? How did you get that no-no, "he will understand"?

Dr. Ryder: I'm opting for Gronlund.

Mr. Monahan: Well, Gronlund still keeps the concepts of Mager in the sense that he requires a statement of demonstrable behavior, but he includes a general instructional objective, such as, understands pre- and post-operative management. Then the specific behaviors listed under that objective explain what is meant by understand and what the learner will do to demonstrate that he understands.

Dr. Ryder: Would it be useful to make an outline of the aspects we haven't covered and then do that small grouping routine again?

Dr. Brower: In regard to that outline, I would much rather you have a sub-title on basic concepts of immobilization, which would be more meaningful than fluid balance to an orthopaedist.

Dr. Garrett: We did touch on that before, but I think that this is where it belongs.

Dr. Huncke: I wonder if it's feasible or practical to try to include in the training ways to sharpen individual observation skills?

Dr. Brower: Yes, it beats me how you teach these observational skills.

Dr. Edholm: But you do teach it to your students.

Dr. Brower: Yes, such things as pain and what pain with activity means, and what pain with no activity means, but, as far as I'm concerned, it's the one-to-one relationship.

Dr. Edholm: But it goes on for four years.

Dr. Brower: No, it goes on when he's in my clinic, though I don't know if the next guy does anything or not.

Dr. Ryder: Would it be useful for me to read for criticism and discussion the aspects of orthopaedic residents' education that I have just sketched out here? (Incidentally, I suppose everyone has heard Walter Hoyt's statement about education and training; i.e., we train animals, but we educate people). The first aspect of orthopaedic education is in the area of clinical orthopaedics. This is what we have covered in the main part. The second aspect is aspects of patient management. The third aspect is sociological interactions. That's the medico-legal, economic. The next aspect is basic sciences in two parts: physiology, specifically muscular skeletal physiology, including mineral metabolism, bone growth healing, etc., and pathology. The last aspect is special clinical evaluation techniques, such as, radiographic and electric.

Dr. Brower: Somewhere we've got to examine the patient and interview him. Now where does that come in? Is that pre- and post-operative routine? Is that what you are after, Dr. Huncke?

Dr. Huncke: I was raising the question of whether, since two of the skills every physician uses in communicating with patients are interviewing and looking at people, which can save you a lot of time when you sharpen this up? Would there be any valid reason for spelling out something like this in detail in a preamble to this document or in principles of patient management? I am hesitant to suggest this because I don't know what we can realistically expect to do.

Dr. Brower: Yes, I would like to get the implication somewhere that you examine the patient. Now where does that fall in those six categories you read?

Dr. Ryder: Yes, I think it's a scope problem. The resident should be competent in interviewing the patient and taking a history. I put that prior to our entry into this phase of his education. It should be something he has attained before he gets into our program.

Dr. Huncke: Maybe this should be in an introduction to this document, that these skills are assumed, and if they are not valid for the person entering the program, then that program must attend to them.

Dr. Garrett: But there are generalities of this which are common to any diagnosis. Under this patient evaluation or diagnosis, or whatever you call it, you could group the x-ray and electrical stuff, all those special techniques as a whole.

Dr. Ryder: You could say that "he would be able to establish a correct diagnosis for 90% of the orthopaedic cases (a) he will be able to elicit in the history" etc.

Dr. Huncke: Could you lower that percentage a little bit, I am beginning to feel somewhat insecure.

Dr. Ryder: Let's put physical x-ray, laboratory and special tests.

Dr. Peterson: And then instead of being Number 7 on your list, it becomes Number 1.

Dr. Ryder: O.K., then that takes us through clinical disorders, patient management. Does it bring us to the next aspect; physiology, pathology, basic science area?

Dr. Huncke: Maybe you had better put in bio-mechanics, too.

(A rather cryptic discussion followed, making references to outlines and materials written on the blackboard).

Mr. Monahan: I think the intent here seems to be to prepare a list of abilities in patient management, assuming that everything that is stated is a Category I. There is no taxonomic statement to be made about these abilities because they are primary. So, perhaps, making this list would constitute the job as opposed to the two kinds of activities we had yesterday.

Dr. Huncke: That depends on how you make the statement. If you get into special diagnostic techniques, I don't think you anticipate, for example, that all residents finishing their orthopaedic residency will be able to do a competent nerve conduction. Simply a "knowledge of" is of value and comes in knowing what can be done, what can't be done.

Mr. Monahan: But that still becomes a Category I. That is, they must know what can be done and what can't be done.

Dr. Huncke: Yes, if you state it as "knowledge of" rather than simply putting down electromyography.

Miss McGuire: Well, you are making the distinction between knowledge of and being able to do all these things.

Mr. Monahan: Yes, O.K.

Dr. Ryder: What we really need to do now is identify what are the essential components of ability and knowledge in the areas that we haven't covered. What specific things are we concerned with now? In the area of basic sciences?

Dr. Brower: Only that which is applicable to orthopaedic surgery.

(Discussion about the difficulties of identifying the specifics in these basic sciences).

Dr. Garrett: I think Dr. Peterson has an outline he should present on a practical clinical application.

(The paper being referred to now begins "Musculo-skeletal Development").

Dr. Brower: Renal physiology, should we just drop that off?

Dr. Ryder: Can we take embryology and say what is the essential component?

Dr. Peterson: Semantic embryology. I think they ought to know what a skeletal muscle looks like, what a tendon looks like, microscopically.

Dr. Huncke: Why do you have to know that? Why should I have to know what a tendon looks like if my problem is the guy who just put his hand in the lawn mower?

Dr. Peterson: To know the best way to heal it.

Dr. Winter: You don't have to if you have an official way to treat it.

Dr. Peterson: Well we are still training physicians and not mechanics.

Dr. Brower: That could be a moot question.

Dr. Peterson: A lot of this will, necessarily, be repetitious, but I think one must improve in one's knowledge, basic to the whole thing. Even if it is just a review, it will be sure to help.

Dr. Huncke: A lot of times, the anatomy they've learned in medical school is not very practical. What they needed was three dimensional anatomy, surgical planes, etc.

Dr. Peterson: That's the anatomy you learned, but they aren't even getting that. They'll be lucky to know that the liver is in there someplace.

Dr. Brower: Anatomy is a post-graduate course. Ask any good anatomist who knows what's going on and he will hold that gross anatomy is not a medical school course anymore.

Dr. Ryder: In trying to define the limits of this thing, take embryology. The general objective is that the resident will know the general principles of musculo-skeletal embryology: 1) he will be able to describe the formation in mesenchyme of a typical joint; 2) he will be able to describe the rotation in the limb buds. Something like that, right?

Dr. Peterson: We could go one step further, I think he ought to know and be able to describe the skeletal development, in other words, the embryology of the bone.

Dr. Peterson: Bone joint, tendon, and muscle development.

Dr. Huncke: He should also be able to describe how this has some clinical application.

Dr. Winter: If we are going to ask him to, we had better be able to.

Dr. Huncke: I'm hesitant to ask people in the clinical fields to describe something in basic science, if they cannot relate it. I think that's where most of the problem in basic science has been in the past.

Dr. Peterson: Well, it was very appropriate from the standpoint that, even if you couldn't define the application of this particular finding at the time, twenty years from now somebody has the background to be able to recognize what happened in particular cases.

Dr. Brower: Here comes this little medical student who says to you "what's all that DNA and rotation of the glucose got to do with those sick folk out there." Then you say "don't worry about that, five years from now you are going to understand it." That doesn't make any difference to him, he wants to know right now.

Dr. Peterson: It's easier to give clinical application for such things as club feet, fused spines.

Dr. Brower: Then let's do that.

Dr. Peterson: Then say, list ten clinical applications to the above.

Dr. Ryder: Or you can put it this way. He knows the general principles of something in embryology and can relate them to the physical disorders.

Mr. Monahan: Yesterday we had read to us an aim of the residency, i.e., to produce an orthopaedist who is competent in the delivery of health care. What is this knowledge about bone and muscle development, etc., contributing to his ability to deliver effective health care.

Dr. Peterson: How far do you want to go at that, because you see I envision the orthopaedist in twenty or twenty-five years of maybe never even operating. He has to be able to relate this knowledge to someone else who is going to tie a tendon together.

Mr. Monahan: I just want to put this aim out again as a guide to the selection of content.

Dr. Brower: Dr. Peterson wants to guard against turning out carpenters, and if you say that what we really want to do is to deliver health care, then in my medical school I should only train this cat to say "uh-huh, he has diabetes, and I treat it this way." That's what society wants, but in universities and among orthopaedists, there exists the concept that maybe a physician should be educated, or have some intellect. Now there is the base, because your definition does not make any arrangement for him to have intellect.

Mr. Monahan: But we haven't defined anything yet.

Dr. Brower: Yes, you have. You have said what an orthopaedist is. What is he? What does he do?

Mr. Monahan: We are simply noting that he is an individual who delivers effective health care in a particular specialty, but in this discussion, the question is the identification of effective health care and its relationship to the knowledge that Dr. Peterson is talking about.

Dr. Winter: Not exactly, it's not an individual who delivers effective health care as of today, it is an individual who delivers effective health care without unreasonable input, five, ten, fifteen years from now.

Dr. Garrett: When you take embryology and relate it to limb rotation--that has a direct application. Here is cardiovascular renal, pulmonary in physiology, as related to trauma in surgery. These are direct applications, deleting all the basic embryology as taught by one of the arts.

Dr. Ryder: I think the educational process is being taken out of context here, what we said was, the aim of the orthopaedic residency training programs is to train orthopaedic surgeons as distinguished from orthopaedic scientists.

Dr. Winter: Except to add that he has to be programmed to educate himself.

Dr. Ryder: That's right. We are simply saying that in order to be basically competent in these areas, he must have certain abilities and knowledge, and one of these abilities and knowledge consistent with his being a physician rather than a mechanic, is something in the area of embryology, and we must try to draw the line as to how much in that area. We don't want him to be an expert in musculo-skeletal.

Dr. Garrett: If we go to the next page of Dr. Peterson's paper --starting with 5--this is basic science as related directly to what we were talking about, it seems to me, and the basic science of all procedures that we are involved with.

Dr. Brower: Where are you, Alice?

Dr. Garrett: I'm on pages 2 and 3.

Dr. Brower: I'll agree with that, there is nothing he said that I could argue with. What we are trying to do is find the universe, that is to say, where the edges of the universe are, and I don't think we can do it. But here is a nice little thing, and I think it is about as far as we can get.

Mr. Monanan: Yes, you've got, so to speak, the elements of your trade spelled out in Dr. Peterson's paper. As long as what he says here is necessary to the effective execution of orthopaedic skills and knowledge, you've done what I was arguing about earlier.

Dr. Peterson: I think that the relevancy of this to an orthopaedist could be dependent on everyone of these points.

Dr. Ryder: Then, as Tom said, the question is, that a universe of knowledge is involved here, I'll agree; it's impossible for anyone to master the whole thing. We are merely trying to say what is essential.

Dr. Peterson: In regard to basic elements, look at #6. A knowledge of how tissue healing occurs gives one the reasons for doing things and helps toward a better understanding. Directly related to that is #7, which then become more clinically oriented. And then, I think I finished off on page 4. I said each individual category has regional application.

Dr. Garrett: There is just one little thing I might change under #15. Where all these principles of orthopaedics are listed under PM and R, they appear under cardiovascular and regional physiology; it's not listed under internal medicine.

Dr. Ryder: Well these sure are the basic areas of the intellectual furbishings a guy should have; they are essential to his existence as a complete and competent orthopaedist, but the question is still the limit. You can take these, you know, and just go all over the ball park.

Dr. Edholm: I think we have to go back again to the word "enough", and write the objectives in such a manner that indicates he's expected to have a sufficient amount of embryology so that he is able to understand the diseased processes or conditions which he must treat. Can we state the expectations in those terms without indicating how detailed his knowledge in embryology must be? If we try to become too detailed in embryology, too detailed in anatomy, we almost come down to the point where he says, well, I have to spend the next five weeks just studying embryology. When that's done, he can forget it. I don't think that's what we want. We want him to be able to relate this continuously to the management of problems.

Dr. Garrett: Could you describe these things in areas of a physical defect or diseases? Would that give us the clinical significance we've been looking for?

Dr. Peterson: I'm defending not just picking and pulling directly applicable material, but a small but broad overview of each area, as such, because we aren't smart enough, I'm sure, to realize the full intent and application of it and, if a guy doesn't even know the existence of this sort of thing, he's an incompletely educated man as far as his own progression in maintaining his abilities later on. So I hesitate to state it so narrowly. These have to be broad enough in order to be adaptable. In order to do this, we can't get the objectives too tight.

Mr. Monahan: If Dr. Peterson's point is taken, you are then preparing a resident to meet some future situation which is pretty well unknown; therefore, you must give it all to him so that he can remember it all and have all of it to choose from eventually. It seems more reasonable for you to prepare him for the moment and also prepare him to continue his own education, then you have a little easier task in the selection of this particular content. Right now, you are shooting the whole thing at him and hoping he remembers it when he leaves the residency.

Dr. Ryder: Right.

Dr. Peterson: I think it's the detail which we are shooting at him which everybody is confusing right now. If I'm giving a discussion of the universe to fifth graders, I'm not going to burden them with a lot of non-essential details, but they are going to get the broad overview of what it consists of.

Dr. Ryder: The way this works operationally is--an embryology is not a bad example--if you just say he will know the general principles of embryology, he'll look at that and come to you and say, what do you mean; but, if you say, know the general principles of embryology: 1) he is able to describe the differentiation of the giant cells and the mesenchyme; 2) he is able to describe the rotation of the limb buds; 3) he is able to describe the oncology of the bone, etc. Now he knows the things that he must learn, and in the process of doing it, he gets into the area of musculo-skeletal embryology. He has some of the general principles. And when the thing comes up five years from now that wasn't involved, he can say that wasn't really the limb buds rotation or the bone's ossifying, but it is an aspect of this person's development that occurred during the embryo, and I can go back into the embryology area and see what I need to know.

Miss McGuire: That's the thing that would be most helpful as a directive in this document.

Mr. Monahan: But he must develop that attitude of continuing education or he's not going to be continuing. The point is that you are getting to a statement of why he needs that knowledge.

Miss McGuire: Some criterion for the selection.

Dr. Peterson: The histology and over-structure belong in here, too, and once again this is stuff they are already supposed to know. This is review, so we don't have to be too ashamed of being too broad in it.

(Dr. Peterson gave a brief statement of the nature of a cell and what an incoming resident could be expected to know about it).

I think maybe we are being too picky in justifying our inclusion of some of these things. The facts speak for themselves, I think.

Dr. Brower: As I said yesterday, I don't see how in the world you can take the field of basic sciences and do a categorization of it. I spent weeks on a committee five years ago, and we couldn't identify it then. You can't do it now. You can play games with yourself, but you can't do it. And if you did, you shouldn't.

Dr. Garrett: If you took histology out of this little place where you are talking about tissue healing and principle of osteogenesis--

Dr. Brower: Which one is wrong now, Alice?

Dr. Garrett: Six and seven are histology.

Dr. Brower: You can't study bone here without studying histology?

Dr. Garrett: I think what you are saying is "do you have to look at this through the microscope in order to know it"?

Dr. Brower: Yes, that's what I'm asking.

Dr. Garrett: Not necessarily, you can read about histology.

Dr. Edholm: What she is saying is that you can study bone healing at the same time that you study histology.

Dr. Peterson: And I'm saying that the guy who knows how it heals grossly--

Dr. Brower: Well, I'm sorry, I can't teach him how bone heals until he knows what bone is histologically. Then, if I want to use the histological approach to bone healing, I can go that way. But, I always have to start off with a resident on the way bone looks under a microscope. This is the way it's organized. Now let's go over to bone healing. And to say that bone healing assumes that he knows histology--I can't do it.

Dr. Ryder: So you could take for your objectives in histology say, 1. He is able to describe the microscopical anatomy of cortical bone, cancellus bone, and epiphyseal plate.

Dr. Peterson: Well let's just make it broader. Tendons, skeletal muscle, fibrous tissue, let's just name the things he'll deal with.

Dr. Ryder: The microscopic appearance of - bone--

Dr. Winter: He's supposed to be able to write that out on a sheet of paper or to say "that's pink, that's bone"?

Dr. Peterson: He ought to know ultra structure, too.

Dr. Brower: When you say that, how ultra do you mean?

(Dr. Peterson's remark is obscured).

Dr. Winter: My question is that when he gets out of the residency and practices orthopaedics, is that going to be the knowledge which he's either going to be, somehow, deriving benefit from in his practice or which he is going to use to evaluate and correct his practice later?

Dr. Peterson: I need to ask this question: Is this whole thing supposed to be 100% competency, minimum level to pass, or are we, once again, beginning to give him a little overload?

Dr. Edholm: Some place in between.

Dr. Peterson: You mean he would have to know, say, 99% of this list and everything else is extra?

Dr. Edholm: I wonder if we could break this up into two areas? What we've been talking about is what a resident needs to know at the end of his program in order to practice effectively. The basic sciences, to a very large degree, are what he needs to know in order to go through his residency successfully. In order to learn all of the clinical things that he has to learn by the end of his residency, he has to, somewhere early in the game, master a certain amount of basic science information. So I wonder if we have to put this material into a separate overall objective?

Miss McGuire: You are intending this material to be a prerequisite to clinical orthopaedics. Something troubles me about that.

Dr. Ryder: Then we could drop it out of our whole discussion.

Dr. Edholm: No, we still have to do it. But perhaps we could tackle it in a little different way.

Miss McGuire: Well I was just going to say, something does bother me about that.

Dr. Edholm: It does sound as though he has to know it before he ever starts residency.

Miss McGuire: That's right. But what you are saying, is that it is associated with understanding the why and wherefore of orthopaedics.

Dr. Edholm: That's right. he's got to go over this during his residency, and the purpose for his going over it is so that he can understand the disease process which he is treating. Not so that he can treat them effectively after he is out, but so that he can learn the disease processes during his residency.

Dr. Ryder: Right, if you put that in the proper structure, then we are talking about interim objectives. Our work yesterday is really a terminal objective and these are the interim objectives. I think that clarifies things a good bit as a matter of fact.

Miss McGuire: Then you can say, the essential elements of understanding are whatever it is that you have to understand by the time you are through. And then we have provided a criterion for inclusion and exclusion; you don't have to deal with the total universe of embryology, but those things from embryology which help you understand the disease process with which you are dealing.

Mr. Monahan: Well that seems to settle the question on physiology then.

Dr. Huncke: And pathology.

Dr. Olson: And the basic sciences including genetics.

Dr. Edholm: Incidentally, genetics is not considered as an element in the scope statement.

Dr. Peterson: No, and I'm sure there are many other areas which have not been, either, and it could be a sub-heading.

Dr. Edholm: Some place in here, I would guess.

Miss McGuire: Is it critical in the counseling of a patient?

Dr. Edholm: We send them to genetic counselors right now. People who are better qualified than orthopaedic surgeons.

Dr. Peterson: But genetic counselors are not readily available every place. So it would be sort of necessary for an orthopaedist, for example, when a patient would ask you, will my other children have club feet?

Dr. Edholm: Well, you would give them a general answer.

Dr. Brower: Look, could a genetic counselor tell them if their next child was going to have club foot?

(Obscured comments in answer to Dr. Brower's question, which seemed to suggest "no" as an answer).

Miss McGuire: Well, before anything then is added to this scope on genetics, we would determine what is necessary for the orthopaedist to know in counseling patients.

Dr. Peterson: It is essential to know what someone else says about genetics later on.

Miss McGuire: This may be one of those "one" and "two" determinations.

Dr. Edholm: It doesn't work into this outline of physiology. I don't know where you would put it in; it can be tied into biochemistry.

Mr. Monahan: Have we concluded with these certain items? Are we going to go through content more in detail?

Dr. Edholm: Or are we going to leave it up to you, Dr. Ryder?

Dr. Ryder: It depends on how much time we want to spend on it now.

Miss McGuire: What kind of guidance do you want at this point?

Dr. Ryder: I think the guidance that we want comes very much out of this listing right here, don't you?

Dr. Garrett: I do. This one of Cooper's, there are a number of areas in here where the basic thing is related to clinical disease and much of it could be incorporated in this.

Dr. Edholm: A combination of these two papers - Dr. Cooper's and Dr. Peterson's.

Dr. Garrett: Yes, these two together.

Dr. Ryder: Then for guidance here in the aspect of physiology, do we agree that the proper topics have been included: embryology, histology, genetics, tissue metabolism, tissue healing, principles of osteogenesis--are they the right topics in that area?

Dr. Edholm: I think that the biomechanics in this particular outline needs to be expanded, although if we combine Cooper's with it, I think it supplements it. The biomechanics here are listed in two areas, biomechanics with internal fixation and biomechanics with orthotics and prothetics and I think we need--

Dr. Peterson: I think we could use biomechanics of growth and development which probably belong up in #1 or #2, because this is just an extension of what happens in utero.

Dr. Edholm: That would be the biomechanics of joint motion.

Miss McGuire: Then these two list together satisfy the need of guidance?

Dr. Ryder: Yes, then what we are saying is that these things listed here are the essential aspects of biomechanics and physiology.

Dr. Brower: May I add then, in either #6 or #7, tissue exceptance, that's what you are talking about isn't it?

Dr. Peterson: You mean compatibility?

Dr. Brower: Yes, compatibility, that's what bone grafting is.

Dr. Peterson: Well it's a broad field--we may be implanting muscle some day. Who knows? So, let's call it a separate thing. I don't care where you stick it. It could be tissue immunology.

Dr. Ryder: Is he talking about response to implants? You are talking about physiological tissue being implanted, and you are talking about hardware transplanting.

Dr. Peterson: Calling it just tissue immunology covers a broad host of things, such as, donor immunology.

Dr. Ryder: Are you including glue, etc. Implants sort of label the whole area. Whether tissue or otherwise, and that brings us to pathology, right?

Dr. Edholm: Well Cooper's outline here lists the general areas of pathology. They may be covered again in the clinical subjects approach.

Mr. Monahan: Would you need a separate category of pathology if you made the statement that the resident must know the underlying pathology of any disease process he deals with?

Dr. Ryder: Well, using Curt's suggestion for the interim objective and the thinking on which it is based, I would say yes.

Mr. Monahan: But his statement requires that these knowledges that you refer to are put into the curriculum but in relationship to the disease process.

Dr. Edholm: Yes, this is what I was getting at, it's a little hard with embyrology to include it in the clinical stages, but with pathology we can do it. Otherwise, it sounds as though we are expecting a block of time spent on pathology. Maybe we should only deal with it in the clinical area and not have a separate listing of pathology.

Dr. Ryder: But taking it from the behavioral standpoint, if we have pathology as a separate category, what behaviors are we going to state in regard to it? That he be able to describe the cellular activity in acute staphylococci infection.

(Somewhat obscured discussion in which illustrations are given similar to Dr. Ryder's stressing the point that it is necessary to know certain pathologies in order to explain things to patients.)

Dr. Edholm: Those pathologies you would have to know and describe would logically fall inot the clinical areas.

Mr. Monahan: The objective you stated, Dr. Ryder, would logically be an instructional objective derived from the content areas you are suggesting in this scope of a curriculum. If for example, one of the objectives is to understand Paget's disease, it would be necessary for the resident to know and be able to describe the pathology in that disease. It seems to me that we wouldn't have to make such a statement in the essentials of competence.

Dr. Ryder: Then you are going along with the idea that the pathology is implicit in the clinical.

Dr. Huncke: You could say that about all the diseases.

Dr. Ryder: And that's the problem.

Miss McGuire: Well, it's somewhat more obvious in the pathology of some than of others-- that it is such an integral part in understanding some patients' problems.

Dr. Garrett: There are some generalities however, that you wouldn't want to repeat, and they are listed on the second sheet of Dr. Peterson's paper.

Dr. Peterson: Well under the category of oncology, instead of calling it pathology or in the board meaning of pathology-- there is cellular anatomy. Once again we are back down to the cell: molecular biology, cancer kemo therapy. This comes out of what we try to develop in working with pathology as a specific core of information to be taught in orthopaedic oncology. Psychogenetics, biologic effect of radiation, and here is a whole bunch of radioisotopes, I suppose. Scanning, and various other techniques for monitoring the spread and effects of. Lymphatic system. And the last thing is basic edemology (?) enzymology, the definition of neoplasia, something about lesion and metastatic spread, how it occurs. Then a classification of soft tissue or bone. Then it's broken down more specifically into lesions of bone, the benign and malignant and then metastic and soft tissue lesions, then listing each specific one at that point. I can see this is going to be an expanding area of information as time goes on. I hope we don't make the mistake of getting this too tight.

Dr. Brower: I am not worrying about you getting it too tight.

Dr. Peterson: In post-operative care and rehabilitation.

Dr. Brower: Well let's go back to what this is all about. Do you mean to tell me that the orthopaedist in some little town who has just passed his Boards should be knowledgeable in those areas of pathology?

Dr. Peterson: It depends on what you want to get into--why you're teaching pathology in the first place.

Dr. Brower: That's the definition I'm after. But haven't I covered it by saying that the practicing orthopaedist should be able to recognize that this individual probably has a malignant lesion?

Dr. Peterson: And that you hope that the generalist or the internist will know.

Dr. Brower: Well no, what patient comes to an internist with osteogeneic sarcoma of the bone?

Dr. Peterson: He comes in saying, "well, I've got a swelling on my leg, doc."

Dr. Brower: Then who is he going to consult if he doesn't see an orthopaedist?

Dr. Peterson: Well your connotations aren't even going to see an orthopaedist, they are either going to see--

Dr. Brower: The orthopaedist is going to bounce around somewhere. All right, my understanding is that we are now talking about the essential components, and I do not believe that the average orthopaedist is ever going to be knowledgeable in this area. In the first place, the disease is a number of people and the number that have this disease are so insignificant in the total picture, there is no need to educate guys to do that.

Dr. Peterson: I think you are correct ultimately in that, you as a practicing orthopaedist, are ultimately not going to deal with neoplasia in orthopaedics. This will be an orthopaedic oncologist.

Dr. Brower: He's going to be a regionalized person.

Dr. Peterson: Right, but as of now that has not happened.

Dr. Brower: Oh, it's happening so fast, because the average orthopaedist who knows that this kid has got osteosarcoma knows he can't afford to treat him, so he sends him to the Mayo Clinic. So his essential knowledge is the ability to recognize that this is probably osteosarcoma, and get him to some other specialist.

Dr. Ryder: And his essential interim knowledge is to know that this is a malignant disease and it metastasizes the chest.

Dr. Brower: He doesn't have to even know that, he's not the guy who is hearing him.

Dr. Ryder: Now this is his interim knowledge.

Dr. Peterson: We're not asking him for all this knowledge in biochemistry, etc. We can teach him what he needs to know in 3 months.

Dr. Brower: In 3 months? For what he needs to know?

Mr. Bligh: In this discussion we may have to do something with our definition from yesterday of what we were talking about in the areas of confidence. We wanted those things which the new Board certified orthopaedists must know as a minimum in order to practice orthopaedics.

Dr. Brower: In our classification from yesterday, a class III means that he must be able to recognize and then refer. Now in this thing that you have outlined, I think it is essential that he be able to recognize and classify the types of bone tumors and with that classification comes the prognosis and all that other stuff.

Dr. Peterson: The rest of the stuff you say it is nice for him to know but he doesn't have to know it.

Dr. Brower: Yes, that's nice to know. But the average orthopaedists out in the boon docks really don't have to know it.

Dr. Garrett: But there are somethings about cancer which are important. Everyone with cancer is not sent to the Mayo Clinic. The orthopaedist should be able to distinguish between malignant and non-malignant, a malignancy from a non-malignancy. It's important to know the effect of radiation on bone. There are many aspects here that should be part of this scope, we don't have to include everything from this outline about psychogenics or cancer kemotherapy or radiation treatment, but only what applies to us in this category.

Dr. Peterson: This is, once again, just a broad overview to include the areas.

Dr. Ryder: Yesterday, we were talking about the minimum competence, but this does not preclude any program who has the facility to provide this extensive training from providing it.

Mr. Bligh: Dr. Garrett, is there any need to specify these things about cancer in our category I?

Dr. Edholm: What we do need to refer to in the pathology here is the describing of the common processes: reaction of bone to infection, reaction of bone to trauma, reaction of bone to radiation, and things that will be a little more difficult to get into the clinical area of orthopaedics, where we begin to talk about specific disease processes. And include in that area neoplasia, for example. We do need a pathology section here, but it doesn't have to be an all inclusive pathology section.

Dr. Ryder: Well let's try a couple of behavioral objectives: a) he is able to write a classification of bone tumors.

Miss McGuire: Recognize them under the microscope. (Someone says no)

Dr. Winter: Recognize the x-ray, characteristics of a benign and malignant lesion.

Dr. Brower: And second is to recognize the thing that is most normally missed, recognize normal from abnormal tissue grossly. The orthopaedist doesn't have to be able to recognize this under the microscope, all he has to be able to do is to extract the abnormal tissue and send it to the pathologist.

Dr. Garrett: He's got to know all the benign ones, and if he took the rest of them and just lumped them together as cancer that would be just fine. But he's got to know the berign ones, and how they differ from the bad one.

Dr. Brower: I think he should be cognizant of that from clinical, appearance, x-ray, all sorts of things. Now you are talking about an adult, and 99 times he is going to see a metastic lesion and he ought to know how to handle that because that's the everyday stuff.

Dr. Ryder: But maybe we can rap up this whole discussion on tumors by saying in behavioral terms that he will be able to describe the natural history of osteogenic sarcoma, Ewing's tumor.

Dr. Peterson: Add them all.

Dr. Brower: Yes, you've got to have the whole list.

Dr. Peterson: They don't know how to recognize it but you give them a name and they can describe it.

Miss McGuire: Well, let's go to the next step. You say you give them a name and they know how to describe it, but unfortunately, the patient doesn't come in with the name.

Dr. Peterson: But once they are cued by the pathologist as to what it is, then they know what to do about it, and that's all we are interested in.

Dr. Ryder: I think we've pretty much covered tumors then.

Dr. Peterson: I think knowledge of tumor spread is pretty essential here.

Dr. Ryder: Well we can put that in too--describing the natural history of the tumor.

Dr. Edholm: I was going to mention the pathology of the metabolic diseases. That could go strictly into the clinical area and not have a separate area under just pathology, itself. As part of the sub-objectives for overall competence in parathyroid disease, cardiac, renal disease, etc.

Dr. Peterson: Something just struck me here, we've got to have this thing cross-indexed because it crosses itself so much.

Dr. Ryder: Then what we are actually saying is what areas of pathology must be considered as pathology: tumors?

Dr. Edholm: General tissue reaction, infections.

Dr. Winter: Energy transfer.

Dr. Ryder: Should infections be considered here?

Dr. Edholm: I think so far as general tissue response. But the more specific reaction should be included in clinical area.

Dr. Winter: Where are you splitting up pathology--bones and clinical bones?

Dr. Edholm: Well it becomes pretty nebulous with osteomyelitis, that's true.

Dr. Ryder: Then we have tissue response to injury, tissue response to infection, tissue response to --

Dr. Brower: Metabolic disease, necrosis or vascular deprivation.

Dr. Peterson: Metabolic response of the bone.

Dr. Brower: And we could have, as every classification does, the category of "miscellaneous". How, also, are we to include fibrous displasia, osteogenous imperfector, osteoid, and all those things we don't know where to put.

Dr. Edholm: We could put them in the clinical area.

Dr. Peterson: After we get through with the prerequisites which are Category II, we could have Category III--lesions of -

Dr. Edholm: We end up calling it malignant tumors, benign tumors, and tumor-like processes.

Dr. Garrett: This wouldn't be too bad, because you could pull out the whole area of pathology and physiology as a separate thing.

Dr. Ryder: So what else then in pathology, besides the big things, tumor and tissue response?

Dr. Peterson: Degenerative processes, I suppose.

De. Edholm: Degenerative processes of the bone and joint.

Dr. Ryder: Have we, then, suddenly arrived at anatomy?

Dr. Garrett: Anatomy to me is something like bone, you need it all.

Dr. Ryder: Our completed orthopaedic surgeon ought to be greatly accomplished as an anatomist in the extremities and the spine. Is that right or is that wrong?

Dr. Brower: That's an overstatement. Do you feel you can learn all there is about anatomy today, in the next year without doing anything else?

Dr. Ryder: Certainly no, but it is an interim objective in this guy's training.

Dr. Huncke: Put it in the proper perspective, I think what you are dealing with is surface anatomy, landmarks at various ages and in dealing with surgery.

Dr. Brower: Well surgical anatomy is good.

Dr. Huncke: Tissue planes.

Dr. Brower: Well I am all for that, but again, if he has not approached the fusing of the acetabulum in the last ten years, do you expect him to do that without reviewing it?

Dr. Garrett: But we're not talking about that, we're talking about the guy who has just finished his residency.

Dr. Winter: You think he should go out with, perhaps, the need to do it without having had a chance to experience it?

Dr. Brower: I'll go along with that, but when he says, know all anatomy--I took a nine-month course and then I taught anatomy for a year, and one year later, after being in biochenistry for a year, I didn't know any anatomy again. It's something that will just not stay.

Dr. Garrett: If you learn it in relationship to surgery, or if you learn it in relation to functional evaluation of the patient, such as paralysis --

Dr. Brower: That's a different anatomy.

Dr. Garrett: You as a surgeon have to translate that functional anatomy to the specific muscle so the surgeon has to have both of them.

Dr. Edholm: I think that a good way to put it might be under the general heading here. We have three types of anatomy that we would like him to know something about: functional anatomy, surgical anatomy and some degree of detailed gross anatomy. And yet that really is one of the interm objectives, whereas functional and surgical anatomy are the essentials in the termination of training.

Dr. Ryder: Well how much should we expect him to know of gross anatomy? Should we say he should be able to trace the course of the brachial artery down the arm or not?

Dr. Edholm: Somebody is going to ask him that, at least I was asked that.

Dr. Ryder: Aside from someone asking him to do that, what does he need to do?

Dr. Peterson: How to fix it, how to know when it's hurting, and how to not hurt it when it isn't hurting.

Dr. Brower: But when he has a case, where he has to expose the median nerve from one end to the other, then he goes back to the book. If he has to do that from rote memory, I think that's ridiculous. You can't do it that way, unless he happens to have a special clinic where he is exposing the median nerve three times a day.

Dr. Garrett: But what you need to know is the relationship of the brachial artery to structures that you will be involved with if you are going to operate.

Dr. Peterson: I guess it almost boils down to this; as you operate you eventually pay more attention to the things, themselves, rather than the names of them. You know there is something under this and it's always there and you always come across it, but you've forgotten the name and you really don't care anymore.

(General discussion - giving examples of a situation in which identifications of parts of anatomy were not necessary for successful operation, as long as one understood the structure of what one was cutting through).

Dr. Ryder: If we try to put this into behavioral objectives, it might come out something like this: he has to be able, in the dissecting room, to demonstrate by anatomical dissection any of the major structures of the spine or extremities.

Dr. Brower: Why? His end point is not working in the dissecting room.

Dr. Ryder: No, this is the interim statement. It's simply the method of trying to define what we mean when we say he must know some anatomy.

Dr. Edholm: Because we hope it will be a beneficial educational exercise.

Dr. Peterson: Couldn't we leave this one pretty broad and just say functional and surgical anatomy with the gross anatomy being implied sending functional and surgical anatomy of the spine and extremities, and that's the whole ball of wax. Half the time you're going to be into something that's different even though you have been through the same thing many times, and you have to know many ways of getting to it.

Dr. Edholm: It's the unusual thing or the uncommon procedure he has to be prepared for: it's something he hasn't done before but is now faced with and he can't go back and look it up.

Dr. Brower: Isn't that the distinction between education and training?

Dr. Edholm: Yes.

Dr. Brower: I see nothing wrong with someone doing a procedure he's never done before, because if he has been educated properly, he knows the steps through which he can prepare himself to do it.

Dr. Edholm: I think this is very important. There is a move afoot by the Joint Commission to indicate that hospitals have to begin to specify what procedures an individual is qualified to do. And this means that every time he wants to do something new, he has to go and ask for permission. If he applies to do a Harrington instrumentation and he's never done one before, the hospital can say it's not going to give permission. So, maybe our reasons for having a resident learn gross anatomy, for example, can be justified on this basis. We don't say how much gross anatomy, but at least we could justify some gross anatomy and not just surgical approaches.

Dr. Ryder: Well the problem still is, how much?

Dr. Edholm: Yes, and I don't know if this brings us any closer to that definition.

Dr. Peterson: This is almost saying you jolly well better know as much as you can possibly soak up and hold.

Dr. Brower: But as you specialize, you need a whole lot less.

Dr. Peterson: But these guys aren't specialists.

> (An extended discussion followed which centered on the dichotomy between education and training in orthopaedics. It seemed to be felt that gross anatomy and analysis about structures, entities in the anatomy, were necessary for the complete education of an orthopaedist or surgeon. The limited scope of "surgical anatomy" seems merely to approximate training in that a resident would learn rote procedures. The problem of just how much constitutes "some anatomy" was left unresolved).

Dr. Garrett: I would like to see more on this physiology-pathology block. I'd like to see someone volunteer for a precis of this information. Someone to take these papers and put it together before we get it.

Dr. Ryder: Fundamentally, this precis would be a listing of those items of knowledge and abilities in physiology and pathology which are minimally required as interim objectives, not that they are going to be taken with the resident for the whole rest of his life as his ability to treat a fracture of the radius is.

> (Dr. Peterson assumed the task of doing this sub-assembling which is to select the topics in these areas and, not necessarily, although if he would like to he may, express them in behavioral terms).

Miss McGuire: We should get these deadlines down as to who is going to do what and when.

Dr. Ryder: Well first of all, Pete's going to do the sub-assembling in the next six weeks. Alice and I are going to do the assembling.

(The meeting concluded with the determination of the following timetable: A sub-assembly for which Dr. Peterson is responsible will be reaching Drs. Ryder and Garrett by by December 1, the completed assembly will be done by January 1, 1972 and circulated to the Center for Educational Development. This document will be returned with any necessary comments to the assemblers by January 15. Any revisions will be done and circulated to the participants by February 15 for their review in preparation for another meeting March 3-4, 1972).

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Jan. '72

APPENDIX

Categories of Competence

I. The orthopaedist, at the conclusion of his residency, is able to establish a diagnosis, define a treatment plan, carry out the required procedures independently or as a member of a multi-discipline team.

II. In consultation and collaboration with another orthopaedist or other physician, the orthopaedist, at the conclusion of his residency, is able to establish a diagnosis, define the orthopaedic indications, and take part in the treatment procedures.

III. The orthopaedist, at the conclusion of his residency, is able to recognize certain disorders that may present with "musculo-skeletal" symptoms and refer the patient for management of the primary condition.

* * * * * * * *

THE ESSENTIAL COMPONENTS
OF
THE GRADUATING ORTHOPAEDIC RESIDENT'S CAPABILITY

REPORT OF THE TASK FORCE

PART II

Edited by

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Essential: ... so important as to be indispensable. --Webster's Third International Dictionary

Orthopaedic surgery is the medical specialty that includes the investigation, preservation, restoration and development of the form and function of the extremities, spine and associated structures by medical, surgical and physical methods.
--By-Laws, American Academy of Orthopaedic Surgeons

INTRODUCTION

The Orthopaedic Training Study has been an eight-year investigation into the nature and variation of orthopaedic residency programs. In its course a proposal to develop a "core curriculum" in the basic sciences led instead to the establishment of a task force concerned with the eventual competences of a resident--the outcomes of his education rather than the curriculum to which he would be exposed.

The task force began with preliminary papers, largely detailing content of the educational experiences, that were written by a number of instructors expert in various aspects of orthopaedic surgery; it then derived the competences that the resident would achieve from these experiences.

The product is this description of essential components. It is addressed to physicians preparing for a career in orthopaedic surgery and to their teachers. It responds to a concern of both--in the large and complex discipline of orthopaedics, what knowledge and skill is "so important as to be indispensible?"

In no way does this document define the scope, type, or quality of the work of an orthopaedic surgeon or any other physician. Emphatically, it has meaning only as an educational tool.

AUTHORS

The authors are educators in orthopaedic residency programs, and all have been associated with the Orthopaedic Training Study. Those are our common denominators. We differ considerably in our professional interests, areas of expertise, educational philosophies, and methods. This document is, therefore, a consensus of perceptions and values--it is not immutable scientific fact. It must, indeed, be reviewed critically and revised from time to time to be a functional educational aid.

Before we could begin to write out the essential components we had to resolve several difficult problems:

1. In what form should the work be cast?

2. What should be the scope of this work?
3. How should surgical and other motor skills be indicated?
4. What place does knowledge of the "basic sciences" have in the essential components of orthopaedic surgery?
5. What place should be given to components the authors judge to be indispensable although they are not ordinarily a part of the contemporary residency program?
6. Does this work establish constraints on competence or on the amount, range, or depth of orthopaedic experience?
7. Who will use this work and for what?

---

1. In what form should the work be cast?

The statements are most clear, we decided, if they are based on the concept of an instructional objective: a statement of the desired outcome of an educational experience in terms of the behavior of the learner, e.g. "The resident is able to measure and record the range of motion at the hip joint." The list of essential components, then, is a list of the objectives of orthopaedic residency education, but the objective-writing methodology has been freely adapted for this application.*

2. What should be the scope of this work?

To keep the text from becoming unwieldly, we have accepted as fact the fundamental competences of a physician and have restricted the listing to the knowledge and skills generally accepted as the province of contemporary orthopaedic surgery. It is assumed, for example, that if a child in a hospital develops fever and a rash during orthopaedic treatment, the surgeon as a general physician will recognize the possibility of chickenpox and will act to assure accurate diagnosis, effective treatment and prevention of contagion.

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*Consulted and adapted were the following: Norman Grunland. Stating Objectives for Classroom Instruction. New York: Macmillan, 1970. and Robert Mager. Preparing Instructional Objectives. Palo Alto, California: Fearon Publishers, 1962.

3. How should surgical and other motor skills be indicated?

The authors perceived the main options to be: 1) that the skills be identified by implication (ability to care for fractures implies ability to do open and closed reductions), and 2) that specific skills or procedures be listed (use of an osteotome, triple arthrodesis). We elected the first option, because a list of basic mechanical skills seemed trite while a list of procedures seemed restrictive and likely to be quickly outdated.

4. What place does knowledge of the "basic sciences" have in the essential components of orthopaedic surgery?

The authors believe that knowing "why" as well as "how" must be a distinguishing characteristic of the orthopaedic surgeon, and we recognize that academic disciplines are the foundations of clinical medicine and surgery. On the other hand, it is rare that the orthopaedic surgeon at work functions as a "basic scientist". His needs require understanding and application of the concepts and principles of the sciences, rather than inclusive knowledge in the domains of the pathologist, physiologist, biomechanical physicist, etc.

We believe therefore, that residency program objectives in the basic sciences are interim in nature: in rather broad terms, they specify abilities that are required to facilitate accomplishment of the major clinical goals of the program.

5. What place should be given to components that the authors judge to be indispensable although they are not ordinarily a part of the contemporary residency program?

The orthopaedic surgeon today functions professionally in a complex of institutions--legal and social as well as medical. His patients' and his own needs oblige him to interact competently with these agencies. The ability to do so is essential in fact; we believe that it should be an objective of residency education rather than something to be achieved only by (often distressing) experience in the early years of professional activity.

A few programs are already teaching in these areas; others will surely adapt the methods of the innovators or develop their own.

6. Does this work establish constraints on competence or on the amount, range or depth of orthopaedic educational experience?

No. We acknowledge that a resident may assume he need know more than is specified here, and that an educator may feel constrained from offering in-depth experience. Both interpretations would be completely false. Programs should use their areas of strength to help residents accomplish as much as possible; residents should exploit their opportunities to learn. It is most improbable that anyone will "know too much" of any aspect of modern orthopaedic surgery.

7. Who will use this work and for what?

We believe that the men and women who dedicate their talent and time to the education of orthopaedic surgeons will contrast their progrmas with this list of essential components, asking themselves "Does the graduate of my program have the knowledge and skills that are described?", and, if necessary gradually modify curriculum, teaching methods, and/or learning experiences so that the answer will generally be "Yes, he does." We believe that individual programs may well find ways to work together so that each can use the strengths of the others to achieve their common goals.

We believe also that residents who are dedicated to service as orthopaedic surgeons will use this work to check their progress and to identify their accomplishments and their weaknesses, so that they can plan independent study and, if necessary, bring problems to their teachers. With common objectives known to both, residents and teachers can cooperate in finding ways to achieve them.

When these questions had been answered to our consensual satisfaction, we authors next developed a classification of the "Aspects of Orthopaedic Surgery" which serves as the reference structure for the listing of essential components. Each class and subclass were considered in detail as the individual components were defined and spelled out. Finally, the whole thing was assembled, reviewed and modified. We are confident that users will take the next--and important--step; to evaluate the instrument and provide constructive criticism.

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Categories of Clinical Competence

I. Ability to establish a diagnosis, define a treatment plan, and perform specific procedures independently or as the orthopaedic surgeon in a multidiscipline team.

II. Ability to establish a diagnosis, define the orthopaedic indications, and take part in treatment procedures in consultation and collaboration with another orthopaedic surgeon or other physician.

III. Ability to recognize that a disease or injury may exist, and to assure definitive diagnosis and treatment by a physician qualified in the appropriate discipline.

In the Clinical Disorders section of the Detailed Listing (which follows) these Categories are used to indicate that the orthopaedic surgeon, at the end of his residency, brings to the care of most patients the ability described by the Category assigned to that disorder from first contact through completed rehabilitation. In cases specified to Category I that are unusually difficult or complex because of prior unsuccessful treatment, rarity, bizarre presentation or other reason, he will normally share responsibility with a colleague as described by Category II. Conversely, he may have had special experience with a condition specified to Category II so that he is able to function independently.

Thus these Categories are descriptive of the norm; they are not restrictive on the individual.

Detailed Listing of the Essential Components of Orthopaedic Surgery

SECTION I. PATIENT CARE

A. CLINICAL DISORDERS

1. Injuries due to trauma

	Category
Fractures and dislocations	I
Exclusions from Category I:	
1. Those complicated by vascular, neurological or visceral injury, or by extensive loss of tissue	II
2. Those confined to skull and face	III
Injuries of ligaments	
Exclusion from Category I:	
Complicated and multiple injuries of ligaments in hand and knee	II
Injuries of muscles and tendons	I
Exclusion from Category I:	
Flexor tendons of hand	II
Burns and other injuries of the integument that can cause deformities	II
Vascular, neurological, visceral and other injuries without skeletal or muscular injury	III

2. Disorders affecting the limbs and spinal mechanism of adults and children

Deformities and impairments due to prior trauma	I*
Exogenous infections e.g. osteomyelitis after fracture	I*

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*General exclusion from Category I:
Disorders in any of the above classes that seriously impair the function of the hand — II

2. Continues

	Category
Amputations of lower limb secondary to trauma or vascular disorder	I
Deformities and impairments due to prior infection	I*
Benign tumors of bone, joint, muscle and tendon	I*
Deformities and impairments due to static lower motor neurone disorder e.g. poliomyelitis residuals	I*
Tenosynovitis, "trigger finger", ganglion	I*
Recurrent dislocations of joints	I*
Hematogenous infections (pyogenic and tuberculous)	II
Malignant tumors of bone, joint, muscle and tendon	II
Deformities and impairments due to cerebral or spinal cord disease or injury e.g. paraplegia, head injury, heredo-degenerative disease	II
Rheumatoid arthritis and related diseases	II
Deformities and impairments due to hematologic disease e.g. hemophilia, sickle-cell disease	II
Amputations of upper limb secondary to trauma or vascular disorders	II

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*General exclusion from Category I:
Disorders in any of the above classes that seriously impair the function of the hand — II

2. Continues	Category
Vascular and lymphatic deformities and disease e.g. aneurysm, Milroy's disease Exclusion from Category III: Thrombophlebitis complicating treatment	III II
Neurological disorders *per se* e.g. spinal cord tumor, multiple sclerosis	III
Hematologic disorders *per se* e.g. leukema, lymphoma, hemophilia	III
Dysfunctions and deformities of psychiatric origin e.g. hysterical paralysis, camptocormia	III

3. Disorders of the limbs and spinal mechanism of adults particularly

Deformities and impairments residual from congenital hereditary and developmental conditions	I
Osteoarthritis, degenerative joint disease	I
Degenerative conditions of muscles and tendons e.g. bursitis, tendinitis	I
Mechanical low back strain	I
Deformities and impairments due to metabolic diseases e.g. gout, osteoporosis	II
Intervertebral disc herniation	II
Deformities and impairments consequent on disorders not classified above e.g. Paget's disease, heterotopic ossification, shoulder-hand syndrome, Sudeck's atrophy	II

		Category
3.	Continues	
	Deformity and impairments due to stroke	II
4.	Disorders of the limbs and spinal mechanism of children particularly	
	Congenital "positional" deformities e.g. talipes, C.D.H.	I
	Disorders of posture e.g. flat feet, poor body posture	I
	Osteochondroses including Perthe's disease	I
	Torsional deformities of the lower limbs	I
	Specific disorders not classified above slipped upper femoral epiphysis, aseptic synovitis, tarsal coalition	I
	Acquired and congenital limb deficiencies including amputations	II
	Complex and rare congenital deformities including congenital deformities of the hand	II
	Exclusion from Category II Simple polydactyly, rudimentary digits	I
	Deformities and impairments due to cerebral palsy, arthrogryposis, neurofibromatosis, muscular dystrophy	II
	Dyscrasias of bone e.g. osteogenesis imperfecta	II
	Deformities and impairments due to metabolic diseases e.g. rickets, Hurler's disease	II
	Meningomyelocele	II
	Deformities of the spine including scoliosis	II

5. Complications of injury and treatment	Category
Wound healing complications	I
Pressure sores	I
Mechanical complications of orthopaedic surgical procedures e.g. loss of fixation, dislocation after reduction	I
Other complications of orthopaedic surgical procedures e.g. vascular, neurological	II
Deep thrombophlebitis and pulmonary embolism	II
Fat embolism	II
Other medical and surgical complications	III

B. METHODS OF PATIENT EVALUATION

The orthopaedic surgeon at the end of residency is able to:

1. Physical examination

Identify and describe deformities, abnormal muscle strength and function, and abnormal joint motion

Identify and interpret abnormal neurological signs

Analyze abnormal gaits

Analyze the effect on function of deformities and impairments

2. Laboratory examination

Select appropriate clinical pathology examinations and interpret the results

3. X-ray examination

Select appropriate roentgen examinations and analyze the films; in unusual and difficult cases with the aid of a roentgenologist

4. Special examinations

Request special examinations (e.g. electromyography) and make use of the results

C. METHODS OF PATIENT MANAGEMENT

The orthopaedic surgeon at the end of residency is able to:

1. Emergency measures

Apply procedures that save life and prevent further damage in any emergency situation.

Instruct in orthopaedic aspects of emergency care.

2. Pre-and post-operative routines

Write appropriate orders for medication, preparation, positioning, and fluids and electrolytes for patients, except for unusual and difficult cases.

Identify promptly any threat to neurological or vascular integrity.

3. Physical measures

Identify indications for using plaster for immobilization, and for prevention and correction of deformities.

Apply effective spica and circular arm and leg plasters, and plaster splints

Identify indications for various types of suspension and skeletal and skin traction

Set up and maintain any standard traction apparatus

Identify indications for lower limb prostheses and orthoses; independently prescribe them and evaluate their effectiveness

Identify indications for upper limb prostheses and orthoses; with the aid of an expert prescribe them and evaluate their effectiveness

Identify needs for crutches and wheelchairs; prescribe, supervise, and instruct in their usage

4. Measures that require allied health professionals

Involve physical and occupational therapists, social service workers and other professionals in patient management programs as appropriate

SECTION II. INTERACTIONS WITH COMMUNITY

A. LAW

The orthopaedic surgeon at the end of residency:

1. Understands principles of personal liability as physician

Informs and discusses events with patient and family

Obtains consultations in response to patient's or his own needs

Maintains appropriate records and consents

2. Understands principles of public liability and compensation

Prepares required reports

Employs the appropriate standards and techniques for the evaluation of impairment

Relates objectively to attorneys and compensating agencies

3. Understands the physicians role in the adversary system

Prepares for court testimony

Maintains professional behavior in giving testimony

4. Understands physicians' relationship with civic offices

Provides information required by statute

Adheres to the rules of confidentiality

B. SERVICE AND EDUCATION

1. Realizes the contributions of vocational rehabilitation and social welfare agencies, schools, etc., to the total welfare of patients

Assists them in obtaining the necessary services of the appropriate agency

Assists agencies in carrying out their tasks

C. PRACTICE MANAGEMENT

1. Understands the socio-economic aspects of effective health care delivery

Describe correct basis for professional fees

Describe types of practice organizations

SECTION III. BASIC SCIENCES

The orthopaedist, at the end of residency, understands and applies principles from the following in the diagnosis and treatment of orthopaedic disorders:

A. Structural and functional anatomy of limbs and spinal mechanisms

B. Pre- and post-natal growth and development

C. Cellular and tissue response to all abnormal states

D. Bio-engineering

E. Human genetics and chromosomal mechanisms

F. Micro-biology

G. Pharmacology

H. Physiology

I. Tissue organization and repair

FLEXIBILITY TASK FORCE REPORT

JUNE, 1972

CLYDE L. NASH JR., M.D.

PARTICIPANTS:

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DR. CARL OLSON
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INTRODUCTION:

One of the goals of Phase II of the Orthopaedic Training Study was the establishment of a Task Force for the Evaluation of the Role of Flexibility in Orthopaedic Education. On December 11, 1971 a preliminary meeting was held of interested individuals from the Orthopaedic teaching community and the Center for Medical Education, University of Illinois. The following report and proposal represent a summary of the thoughts expressed at this meeting and the pertinent data obtained from the Training Study as it bears on the consideration of the introduction of Flexibility into Orthopaedic Education.

FLEXIBILITY PROPOSAL

I. INTRODUCTION:

The term "Flexibility" has been used frequently in discussing approaches to Orthopaedic education with certain benefits to such an approach implied, but rarely spelled out. The changing complexion of medical education in terms of curriculum, attitudes, student background, socioeconomic trends, and time requirements have reinforced the need to look at this concept in greater detail. However, if decisions regarding variations in approach to curriculum, responsibilities, and teaching are to be made they must reflect an overall set of educational objectives. These goals and the resultant Flexibility proposals must in turn be pertinent, realistic, and applicable or they will be rejected as too idealistic or simply more trouble than they are worth.

The following material is presented to help clarify the role of "Flexibility" in surgical education. It should be considered in light of two levels of application, namely:

A. As an organizational format for the implementation of innovative research projects related to improving medical education systems.

B. As a guideline for evaluating the role of Flexibility in a currently existing program. (i.e., Where does it now exist? What does it accomplish? What changes should be made? What changes can be made?)

II. DEFINITION AND PURPOSE OF "FLEXIBILITY":

Broadly speaking "Flexibility" can be defined as the degree to which learning programs can be varied to meet the individual educational needs of a student.

Ideally the purpose of "Flexibility" is to maximize the student's potential competency within a given educational system.

III. INGREDIENTS OF "FLEXIBILITY":

In order to consider the role of "Flexibility" in achieving maximum competency, the following areas of educational endeavor must be delineated. Each of these areas will be briefly summarized while a more specific discussion of the particular problem will be presented in the appendix.

A. Definition of Educational Objectives:

The desired "terminal behavior(s)" of a student completing his education must be defined. They will represent a combination of factors based on the individual's needs and the program's concepts of the essential components of competency as they relate to the individual. Once terminal behavior is defined it can be subdivided to provide guidelines for sequencing progression through a particular segment or an entire continuum of medical education from medical school or residency. The Orthopaedic Intraining Exam, Board Certification Examination, "Essential Components of Competency"and Chief's Rating System can be collated at this end.

B. Definition of Spectrum of Educational Goals:

Since medical education represents a continuum, all phases of the curriculum must be considered in determining the role of "Flexibility" because changes in approach in one area will affect programming of variations in other areas. The following major subdivisions have been defined to facilitate the stepwise organization of educational goals, levels of competency, and methods of achieving "Flexibility".

1. Phase I: Pre med and medical school period. (Appendix B)
2. Phase II: The post graduate basic clinical surgical period. (i.e., internship, general surgical residency) (Appendix C)
3. Phase III: The specialty training period. (i.e., Orthopaedic)

C. Definition of Possible Approaches to "Flexibility":

There are two basic methods by which "Flexibility" can be achieved. They are not mutually exclusive but rather can be used in combination to meet the particular needs of a specific program. An individual program may with modification use one or several of these options depending on its own resources and limitations.

The first approach is variation in organization, i.e., how the student, the time, and subject material are selected and sequenced.

The second is a variation in the way educational material is presented within the organizational limits of a defined program.

The following is a summary of possible approaches to each of these major areas:

1. Organization: (Appendix A)
    a. Vary all the organizational parameters except the definition of final product which must coincide with guidelines suggested by the "Essential Components of Competency" and the standards set by the OTE.
    b. Vary all organizational parameters except fixed time rotations. The goal is to assure that everyone reaches his own maximum competency in a standard time. Note that here the "Flexibility" is in the nature of competence at the end point. It might be argued that this is what we do now though it is questionable that the variation in experience is really in response to individual needs to maximize competence.
    c. Vary the sequencing and material by establishing "Track" systems that have specific objectives. Selection would be based on screening evaluation of the entering individual and the student's desired goals.
    d. Vary the level of initial placement in standard rotation program. Placement would be based on competency evaluation screening. Once the level of introduction into a standard program is chosen, the

student would then proceed through the program at a predescribed pace.

e. Vary the student's selection of a particular program by screening the person to match a specific type of program. Once the person is matched with a program he would follow through the standard sequence of that program.

2. Educational Material and Technique: (Appendices A, D)

a. Vary the service/learning ratio to maximize educational efficiency. Each teaching area of a program would be analyzed to determine time spent doing service as opposed to the amount of time spent in educational pursuits. One approach would be the evaluation of work load in terms of the number of clinic patients and inpatient beds per student.

b. Vary the use of teaching personnel to maximize their particular talents; i.e., use of tutorial, preceptor, seminar, lecture, and "rounds" approaches would be based on an evaluation of the make-up of faculty teaching talents.

c. Vary the spectrum of faculty teaching potential by participation in staff development programs.

d. Vary the teaching material exposure; i.e., clinic, private service, outpatients, inpatients, disease types, and age groups.

e. Vary the use of individual program instruction (IPI) material to allow increased individual pacing of education.

D. Establishment of Evaluation-Feedback System: (Appendix E)

In order to provide a meaningful approach to both the sequencing of an individual medical education program and the achievement of maximum educational efficience, pertinent ongoing evaluation-feedback system must be established. The student and the program must be able to profile educational progress, effectiveness, and level of competency in order to make the most appropriate use of the opportunity for "Flexibility".

E. Establishment of Counseling Program: (Appendix F)

An effective counseling system must be established to coordinate the evaluation-feedback data and programming in order to produce maximum educational efficiency. Educational decisions made in this manner will then be pertinent to both the student and the program.

F. Administrative-Licensure Coordination:

Once a program is proposed it must be cleared through all involved educational institutions (i.e., university, medical school, hospital), to coordinate long range planning, budgeting, and service requirements. Similarly, state licensure and medical board examination requirements must be modified to allow for variations in timing and curricular patterns.

IV. PROPOSAL:

The above definitions, purposes, and ingredients will be meaningful only if they can be formulated into a feasible plan of implementation.

The following outline summarizes the areas of application and the time table by which they can be obtained. A more detailed discussion of each of the proposals will be found in Appendix .

IMMEDIATE GOALS:

Academic - Organizational:	Clinical:
1. Correlation of data related to Flexibility as collected by the Orthopaedic Training Study (See Summary Reports Phase I and Phase II - Appendix A)	1. Circulation of Flexibility and Essential Component Reports to Chiefs of teaching programs.

Academic - Organizational:

2. Combining of Essential Components of Competency and Flexibility studies.
3. Establishment of Permanent Flexibility Task Force Subcommittee.
4. Establishment of Innovative Projects by interested programs. These can be applied to any or all of the Phases of surgical training.
5. Introduction and evaluation of recently completed pilot IPI materials.
6. Review of Orthopaedic Board Certification requirements as they pertain to Flexibility and personnel changes as appropriate.
7. Recruit professional educational researchers for use in establishing and evaluating surgical educational research programs.

Clinical:

2. Evaluation of individual program by chiefs to determine current and possible additional use of Flexibility.
3. Use of Flexibility Task Force Personnel for consultation in regard to specific program.

LONG RANGE:

Academic - Organizational:

1. Establishment of several demonstration centers which would coordinate the data from the Orthopaedic Training Study, the

Clinical:

1. Incorporation of IPI into teaching programs.

Academic - Organizational:	Clinical:
innovative programs, and other educational studies of a comprehensive approach to surgical education.	
2. Establishment of Surgical Educational Institute(s).	2. Widespread incorporation of Flexibility approaches based on feasibility studies by selected programs. Established Surgical Educational Institutes would provide consultation service for specific programs.
3. Establishment of liaison with other surgical specialty boards, hospital teaching programs, and medical schools.	

A more detailed discussion of each of these proposed will be found in Appendix   .

V. SUMMARY:

The above material has been presented to help clarify the role of Flexibility in medical education while outlining an approach to the further understanding and application of this concept. It is not intended that all the material will be pertinent to all situations. Rather it is a proposal which is intended to stimulate greater interest in the educational research and clinical possibilities of Flexibility by providing a framework within which these efforts can be effectively coordinated.

The material present in the Appendices is intended to augment the proposal outline. Additional material will be added as appropriate.

APPENDIX A

FLEXIBILITY TASK FORCE

SUMMARY OF PERTINENT EDUCATIONAL DATA

(Phase II Orthopaedic Training Study)

I. Introduction:

Phase II of the Orthopaedic Training Study has been summarized in detail as of June, 1972. The following represents a summary of the areas of data that bear on the concept of "Flexibility". Based on the format of the Phase II study, the areas are divided up into those having to do with the individual, program, and institution.

A. Individual:

In the analytic study of the characteristics of the individuals going into Orthopaedics, it was correlated with their performance on the OITE scores and it was found that there was significant factors which helped predict performance. These include such things as:

1. Younger age.
2. Higher college and high school grade point averages.
3. Emphasis on academics and less emphasis on technical ability.

If the individual was considered in terms of his attitudes as correlated to his performance then the following items appeared to be important:

1. Individual generally perceived need for more responsibility.
2. He perceived need for more surgical experience.
3. He felt there was generally an adequate number of private patients and elective time.
4. He did not consider the ward patients care to be too much.
5. He did not feel that the demands made upon him were impossible.

Additional studies of the individuals who were permitted to take their Board Certification Examinations early (ARBC's) indicated that these individuals were identifiable as high performers, early in their training program both on the basis of their OITE scores and Chiefs ratings. In terms of background they tended to have some identifiable differences from their peers in terms of such factors as having parents who had generally higher level of education, coming from larger communities, having chosen Orthopaedics early, being concerned about making an adequate income, having higher undergraduate grade point averages, being more anxious about their acceptance into the program and feeling less sense of competition once in the program, and finally having somewhat greater sense of satisfaction with the training program itself.

It is interesting to note that despite the early identification of this group as superior achievers and their early completion of Board Certification, with the exception of two individuals all chose to stay on in their programs to complete their scheduled time. The majority gave as a reason a sense of needing to "complete the program" for further experience and to not miss the benefits of the best part of the rotation (i.e., being chief of service). Therefore there appeared to be a discrepancy between the concept of competency as evaluated by Chiefs ratings, OITE scores, and Board Certification scores and the individual's evaluation of his preparation to progress to a fully responsible community practice situation.

It seems that there are identifiable differences in background and attitudes of individuals going into Orthopaedics that would permit a meaningful degree of prediction of their performance. The ability to define these factors, therefore, allows a more precise definition of the nature of the individual in the program and his needs for individualized training.

B. Program:

Here again summarization of the research data indicates that there are identifiable characteristics of programs which are meaningful in terms of prediction of performance on OITE, total multiple choice, and total PMP scores. The following is a summary of some of the points that either allow prediction of higher scores or separate high scoring programs from low scoring programs:

1. University programs have statistically higher total multiple choice scores that nonuniversity programs.

2. In a university program, undergraduate grade point average can better predict performance than the various specific variations from one university to another.

3. The nonuniversity program higher performances were correlated with increased amount of staff who were involved in clinical work.

4. Programs that deemphasized technical aptitude as criteria for selection of residents did better.

5. Programs in which the residents felt there was adequate elective time and not too many cases scored better.

6. Programs in which supervision at time of surgery was provided only when needed rather than on a constant basis did better.

7. Programs in which residents were expected to teach medical students in which there was sense of intellectual emphasis scored better.

8. In a nonuniversity program, higher scores were achieved when the residents expressed opinion that they understood the objectives of the program well and that they did not perceive the Board Examination qualifi-

cations as being too severe.

9. In the university program, the prediction of scoring in the PMP was more associated with the type of program than on individual variation of one program with another, (i.e., once again the university program did better than the nonuniversity program but from one university program to another there was no correlation of difference with minor variations).

10. Programs which had earlier rotations in trauma and evidence of giving early responsibility to the residents tended to score higher, particularly in the PMP total scores.

In addition to the above areas the analytical study of factors within the program showed that the following had influence on the overall scoring of the program.

1. The academic status and location of the chief of the program.

2. Residents were selected on the basis of their academic background and interests rather than on their technical aptitude or performance in the internship.

3. Programs with stated objectives to train community orthopaedists as opposed to academicians or researchers did better.

4. Programs with wider clinical material makeup did better.

5. Residents of a wider variety of specialists in the program tended to correlate with higher scores as well.

In a study of performance on OITE multiple choice totals comparing the ten highest scoring programs with the ten lowest scoring programs, certain additional differences were noted as follows:

1. Ratio of average number of inpatients Orthopaedic bed per resident was 50% higher in the lower scoring than the high scoring programs.

2. The average number of Orthopaedic clinic visits per resident was 100% higher in low scoring programs that in high scoring programs.

3. Ratio of number of attendings significantly involved in teaching to the number of residents was 50% lower in the high scoring programs than in the low scoring programs.

There were additional findings in this study that corroborated the data concerning programs given above.

It is interesting to note that the data did not support the concept that variations from one program to another made significant difference in predictability of performance as well as the general nature and tone and objectives of the program itself. Individual makeup within the particular program did not tend to predict scoring except as it related to the person's prior academic record.

C. Institutions:

Data regarding the nature of institutions and their correlation with higher performance on the OITE scores indicated that the following characteristics had some predictive correlation with performance. For purposes of this report, institutions means the individual hospitals and facilities which go to make up the Orthopaedic program.

1. Programs where institutions tended to have separate staffs without significant overlap did better.

2. Institutions where there was a broader variety of patients without a preponderance of trauma cases did better.

3. Institutions with larger numbers of residents and staff also tended to do better.

Except for the above items, institutional variations did not provide high predictive correlations with performance.

D. Evaluation and Feedback:

A great portion of the Phase II study was devoted to the validation of the OITE, Board Certification Examination, and Chiefs Ratings as valid instruments of evaluation. The data indicated that there was close correlation between these factors, particularly the Chiefs Ratings of clinical, basic science, and overall competency to the total multiple choice and PMP scores. This was further confirmed in the ARBC evaluation of these factors. The data then tends to substantiate that an effective evaluation program has been established in terms of stated goals used to develop these instruments.

APPENDIX B

FLEXIBILITY TASK FORCE

PHASE I: PRE-MED; MEDICAL SCHOOL LEVEL

A. Introduction:

Traditionally, this has been the period for acquisition of "basic" science knowledge with career choice deferred to later years. However, with progressive foreshortening of the time between entering medical school and selection of a specific field of education, the early years must be structured to provide both educational and career decision background data. This approach is not incompatible with current general educational goals and is quite compatible with the growing trend to introduce "clinical correlation" in the beginning years.

The educational system therefore must make provision for these special considerations which the identity seeking process demands. Introduction of effective Flexibility is predicated on a system of well defined, graduated career decisions. Therefore, among its other goals, the educational process at this level must attend to the following needs:

1. Expose the student to a broad range of interest areas.
2. Provide for a basic educational experience appropriate to a subsequent general or specific career choice area.
3. Identify and evaluate student abilities, knowledge, skills, interests, and potential.
4. Provide placement counseling to assist in program planning towards career choice.
5. Provide for career choice changes with minimal loss of time.
6. Coordinate current curriculum with the educational requirements of the desired career field.

B. Flexibility Proposals:

The following proposals for Phase I are based on these needs.

1. Basic Teaching Module:

During the final year of medical school, a basic course in surgery could be given which would be the foundation for further specific career choice in surgery. It would have the following basic format.

a. Basic Science:

Problem oriented approach to Basic Science aspects of surgery.

b. Preclinical Correlation Covering:

1) Surgical specialty survey.

2) Basic surgical skills training.

3) Surgical refinement of history taking and physical diagnosis.

This approach would deal with the problems of providing an introduction to surgery, a learning experience applicable to a broad variety of surgical career choices, and a method of evaluating career interests, skills, and potential. This would not supplant the need for all students to have basic clerkship in surgery at an earlier level, but rather more effectively deal with those who have made the broad choice of surgery.

2. Identification - Student Profile:

The above educational proposal can be expanded to include evaluation of personality, aptitude, and interests of persons who have made the initial broad choice of career in surgery, providing basis for evaluating and counseling students in defining their surgical career choice. (See APPENDIX E. "The Role of Evaluation in Flexibility")

3. Placement Counseling:

The final aspect of an overall approach to the early surgical candidates is the establishment of an adequate counseling system that would facilitate the placement of a student in the proper area and help him plan his program most effectively. The data obtained as a result of the basic educational and identification-profile programs would be correlated with the various opportunities available for further education. (See APPENDIX F. "The Role of Counseling in Flexibility")

APPENDIX C

FLEXIBILITY TASK FORCE

PHASE II: POST GRADUATE BASIC SURGICAL EXPERIENCE:

A. Introduction:

This period would provide the transition from the basically wide based and academic Phase I to the specific, directed exposure of the Phase III (i.e., Orthopaedic training). This period represents the post M.D. degree phase of education. It is the first entirely hospital based part of the program and represents the first opportunity for individual responsibility for patient care. The basic and skills learned in Phase I will be expanded and tested. It is also the period in which "Service" requirements become significant.

B. Program Description:

1. Areas of Coverage:
   - a. Service Requirements
   - b. Further Skills Training, general, early, specific
   - c. Further definition of career choice
   - d. Preparation for Phase III specialty training by participation in direct and related areas
   - e. Ongoing Evaluation with counseling and redirection of education as appropriate: requires coordination with other specialties.
2. Parameter of Phase II Training Program:
   - a. Time Requirements will be based on several criteria:
     - 1) Number of related areas to be covered in preparation for Specialty Phase III
     - 2) Basic time unit to be used for rotation through related areas (i.e., basic 2 month units which can be added together as appropriate for emphasis or enrichment)

3) Specific needs of student based on ability and needs

b. Related Areas to be covered will be based on specific needs of the specialty choice (Phase III) and the student.

c. Level of REsponsibility within a specific area can be varied to match the student's ability as well as prior training. However, the need for variations in levels of responsibility should be minimal if Phase I evaluation has been utilized effectively.

d. Service Requirements can be met by providing uniform building blocks of time, adequate preplanning of schedules based on adequate ongoing evaluation techniques, and flexibility in sequencing. Most areas of exposure at this level do not require background exposure greater than that provided in Phase I.

APPENDIX D

FLEXIBILITY TASK FORCE

"SERVICE" REQUIREMENTS AND FLEXIBILITY

A. Problem:

The perception of hospitals to provide a level of medical care has a strongly limiting influence on the possible incorporation of Flexibility into a training program. Because residents are paid by hospitals, the control lies within the hospital administrative mechanisms rather than the academic organizations. This barrier requires that each program carefully evaluate the nature of their "service" and "academic" requirements and the interaction of these two areas. Until these definitions are made no significant approach to altering the nature of programs to provide Flexibility can be achieved. The following represents an approach to this evaluation.

B. "Service"/"Academic" Delineation:

1. Responsibility for patient care within an institution is not necessarily exclusive of that situation having academic value. The question becomes, "When does a situation cease to be a learning experience and become a 'work' experience?" The Orthopaedic Training Study showed that there was evidence that if the ratio of outpatient, inpatient, and staff to the number of residents exceeded certain limits, then these programs tended to score poorly in the examinations. This would indicate that there is generally an optimal ratio of patients and teaching staff to residents that provides an opportunity for learning within a situation providing patient care services. It is on this basis that initial analysis of the academic environment of the institution should be started.

   This approach is further supported by evidence that programs in which the resident perceived that there were not too many ward patients, that they generally wanted more responsibility for patient care and finally felt that they would prefer to have more surgery, did better in their academic scoring. These high scoring programs also carried with them the attitude of the residents that they had adequate elective time. It would seem therefore that in programs in which there is an overload of patient care related to the number of residents and size of the teaching staff that the academic environment suffers and that the delivery of patient care becomes work oriented rather than learning oriented.

2. Suggested Approach:

Based on the above concepts, it would seem that the initial approach would be to evaluate the institution in terms of its staff and patient care load ratios to residents in order to determine whether it falls within the ranges found to be effective for teaching purposes by the Phase II Orthopaedic Training Study data. A profile for all services and institutions within the program should be done. This would allow the program to change within its own makeup if there are any disproportionate facets in the program.

This data would also provide a basis for further discussion with the institution regarding the balance between the delivery of patient care services and the academic commitments of the institutions. In this way rigidly perceived service needs by the administration may be significantly altered and made potentially more flexible so that changes within the academic program to meet the needs of people can be instituted.

An additional factor which must be evaluated by the teaching program is the level of training required to carry out specific area of patient care responsibility. It is evident from the Orthopaedic Training Study that residents are desirour of earlier responsibilities and that in cases where this is provided it correlates with much higher scoring on subsequent examinations. This would indicate that patient care needs can be reoriented particularly in earlier phases of medical education, leaving the latter years of education for the more specific needs of the individual. The delivery of a known amount of patient care should be precisely defined in terms of the level of medical expertise necessary to perform it, (i.e., it is very conceivable that a properly supervised fourth year medical student could be carrying out patient service responsibilities that a first, second, or even third year resident is now doing). The educational benefits would be providing earlier patient responsibility to the fourth year medical student and also freeing the more advanced resident for more specific training.

An alternative approach to the problem of service requirements would be to run parallel services in which the resident is in a purely work environment alternating with purely "academic" environment. There are certain areas of medical education which lend themself to such a concept, such as period of basic science or research endeavor but in other areas it is difficult to separate the patient care treatment and responsibility from the learning process. However, once again each institution must evaluate its work and its academic responsibilities before it can begin to structure a program that meets both needs.

APPENDIX E

THE ROLE OF EVALUATION IN FLEXIBILITY

DR. CARL OLSON

Evaluation is often defined as the collection of data for decision-making purposes. The demands of modular scheduling are such that three types of data are required for effective decision making if the learner is to achieve mastery of the subject matter.[1] The first is ongoing, continuous, formative evaluation to provide information useful for directing the study and other inplements of of learning. For example, such decisions as when "enough" time has been spent in the traction or plaster learning laboratory, when basic surgical technique has been "mastered".

The second requirement of an effective evaluation strategy requires summative or end-of-instruction evaluation primarily to certify the achivement of the student. The obvious extant example is the Board Examination. However, some programs presently use the OITE as a check on the individual's competency before permitting him to continue in the program.

These two provide effective framework within which the decision-making process may take place efficiently. The first is to provide an ongoing feedback to both program and student at a time when weaknesses and noted deficiencies can be corrected relatively easily and quickly. The latter provides an opportunity for the application of an external "yardstick" common to all programs to estimate the overall ability of the program to provide effective training experiences.

These elements seem to be satisfactory evaluation base, once tne student is in the program. However, they do not provide data for decisions regarding initial placement, i.e., where the beginning point of a student's program ought to be. For instance, as shown by the study of the early Orthopaedic residency board candidates, some individuals appear from the beginning to possess knowledge, skill, and ability that mark them as superior to their fellow students. Requiring them to participate in experiences designed to teach them skill level already attained is extremely wasteful of time, resources, and enthusiasm.

Moreover, the portion of the residence most analogous to independent practice (chief or senior resident status) should be preserved, and final judgments rendered by those both intimately involved and best qualified to make the judgment. Preservation of at least part of this segment of the residency means that reduction in time (if that is one aim of flexibility) should be accomplished elsewhere. Thus, advanced placement or standing within the educational training structure could accomplish both purposes: shorten the training time where appropriate and preserve those exposures and experiences that can be used to collect further evaluation data through personal observation and contact.

Once this general plan is accepted as an operating framework, the activities required to support it can begin. These are outlined:

1. Identify content elements (terms, facts, rules, synthesis, skills, types of problems, etc.) which have not been introduced to student in prior experiences.
2. Define the level of cognative function (memorization, explanation, application, analysis, etc.) necessary for a student to master each new content element.
3. Specify relationships between content elements at different levels of

cognative functioning. The relationships should indicate which content elements at simpler levels are prerequisite to learning content at more complex levels.

In short, criteria indicates the essential components of competency which are being identified by one task force in the Orthopaedic Training Study. These, combined with the formative, summatize, and advance placement steps outlined above, constitute the contribution of evaluation toward the development of flexible programming.

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[1] Block, James (ed.), Mastery Learning Theory and Practice. New York: Holt, Rinehart, and Winston, 1971, pp. 77-78.

APPENDIX F

THE ROLE OF COUNSELING IN FLEXIBILITY

C.L. NASH JR., M.D.
CARL J. OLSON

Traditionally, medical career decision making has usually been postponed until the last possible moment. This does not reflect a basic inability of students to make a decision, but rather their basic reluctance to do so. The reasons for this lack of readiness to make choices are not particularly obscure when the current medical educational structure is viewed in light of theories of how persons arrive at career selection. The ingredients necessary to make decisions are not all present at the same time. However, proper decisional sequencing is essential to the most effective educational advancement of a student. It achieves two goals: First, it allows progression towards a goal in the most efficient manner possible and second, it assures the student that the direction in which he is going is the best one for him. Under these conditions, the student's enthusiasm will be maximized resulting in a high level of productivity and positive feedback.

Although there are several theories regarding vocation selection processes, the one which seems to encompass most elements is Super's[1] proposal of a series of increasingly discriminating decisions. Career selection evolves developmentally from a sequence of action-reaction situations. The ingredients necessary to promote this chain of events in a meaningful manner are:

A. Establishment of a personal data and definition feedback system.

B. Adequate display of the spectrum of feasible choice options.

C. Matching of point A and B.

D. Opportunity for reality testing of choices before irrevocable commitment is established.

Points A, B, and C are the domain of counseling and do not represent a new approach (Parson, 1906)[2]. They have an established effectiveness if properly approached and are feasible within a medical educational system.

Point D falls into the realm of medical curriculum planning. The concept of "rotations" through a particular area of medical discipline allows the student to compare his concepts of self and career identification with the "reality" of that discipline without being committed to that area. If this approach is combined with educational goals at all levels of training, two benefits will be gained. First, the process of acquisition of medical information will be reinforced and second, the correlation of education and personal profile with the business of being a doctor will be further clarified.

Although this approach to counseling should apply to all phases of medical education, further delineation of its relevance to Orthopaedic training will be discussed in order to suggest practical modes of appreciation.

The data from a large number of research studies suggests that each medical specialty has a characteristic set of attitudes and aptitudes which differentiate them from those in other specialties. Early identification of the attitudes and aptitudes of medical student could facilitate their selection of a medical specialty and provide the basis for career counseling.

Counseling might well take the form of surveying the individual in a number of areas (attitude, values, career aspirations, knowledge of career, etc.) and constructing a counseling profile based on this performance. The Kuder Preference and other inventories utilize this method of reporting results. The individual's profile is then compared with those who are presently in a given specialty in an attempt to obtain reasonable profile matches.

In Orthopaedics, the counseling might well be a non-forced choice series of instruments designed to help the counselor explore with the potential resident his profile compared to others who have demonstrated success. The report might well take the form of "betting odds", suggesting that the potential resident profile is similar to those who are most successful or who have difficulty in certain aspects of the specialty. However, it would not be an excluding device, i.e., one that would keep men out of a program, but rather a survey that would alert both resident and program to sources of potential danger by saying, "You score like a resident who had difficulty mastering surgical technique", or "You score like a resident who encountered difficulty in dealing with nurses and other allied health personnel." Non-career committed "rotation" experience would be the "in vivo" expression of this approach to help test the reality of the proposed comparisons.

Thus, the resident and program would be aware of areas of deficiency, incompatibility, and the extra effort certain candidates might require. Perhaps such a counseling strategy would be self defeating - those who were counseled, being alert for specific problems would concentrate on them to such an extent that new profile data would be required to periodically update the basis upon which the predictions were made. However, periodic profiling of the student would be part of the ongoing evaluation system so that this potential problem would be recognized.

Obviously, only the specialty resident level of profiling has been discussed here. Extension of this approach to earlier levels of medical education is equally feasible.

The ultimate refinement of a counseling and placement system such as outlined above would include recommendations not only for a specialty, but program and placement within that specialty. This could include matching program and potential resident's profile to provide a graded list of programs and placements.

The preput could include listing programs in order from greatest to least probable of success for a given resident. Such a profile might also include the level at which the resident could begin in a given program, or when coupled with a test of knowledge, indicate the area in which skill mastering only would be required.

As a result, the resident would know the degree of success he could reasonably expect in a given program, the areas of weakness, and those in which sufficient competence had been developed. With both program and resident appraisal of this information, both could make choices based on factual information.

TITLE: Staff Development

PURPOSE:
1. Self-study materials for attending staff to improve teaching skills.
2. Orientation and introduction to education for new attending staff.

TARGET POPULATION: Attendings and Senior Residents interested in Education

BRIEF DESCRIPTION OF MATERIALS: Especially developed and selected

Especially developed and selected source materials, plus "trigger" films are combined to provide a relatively autonomous series of teaching materials. Most include demonstrations of good technique.

UNIT ARRANGEMENT

12 learning units, most with 2 sessions, each can be utilized independently or sequence can be altered to meet local conditions.

OTHER:

STAFF

DEVELOPMENT

STAFF DEVELOPMENT

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Instructor's Notes

Introduction

The suggested situations and instructional outlines contained in this manual are simply that--suggestions. It is anticipated that each user will modify these materials for his own. specific setting and specific purpose. Additional uses, new applications, and innovative developments, hopefully, may occur to the user with greater familiarity and experience.

General Outline

Each learning unit is designed as a relatively autonomous one, requiring neither a specific antecedent nor follow-up unit. Most are accompanied by at least one instructional guide, designed primarily to serve as a model for further development as dictated by the local situation.

To help you develop some skills in lesson planning, the "Guideline for Presenting Units of Instruction" and "Characteristics of Desirable Learning Activities" are included for your use. You may wish to distribute these later to participants, but their primary purposes are to sharpen your skill before presenting any of the learning units and provide a well organized initial presentation.

Within each learning unit are several adjunctive parts which may be varied according to local conditions. While the number of parts may differ from unit to unit, they typically include:

1) A "Trigger Film" designed to be used according to the generalized film guide as an initiator for discussion. Since this is a relatively new technique, a film guide outlining the goals and objectives of the trigger films developed for use with these materials is included as Appendix A.

The film guide discusses the way in which these films may be used; some are designed for very specific learning units, but may be adapted to other appropriate uses.

2) An instructional guide pointing out research data, general comments on the topic and/or a list of references to other educational works that may have bearing on the lesson unit intended primarily for background information.

3) A brief article or monograph written by an authority in the field, that is especially pertinent to the lesson unit.

4) An instructional sequence showing one suggested break down and outline for teaching the unit.

5) An evaluation method or instrument designed for use in evaluating local effects in the area being discussed.

Again, these may be used in a number of ways depending upon the resourcefulness of the local staff person conducting the series. For example, the negative "feedback" film is equally appropriate as an introduction to one-to-one teaching. It should also be noted that the instructional sequences are not related to a time constraint. Since a variety of local circumstances may impinge on the way in which materials are developed, it was thought best to leave the actual time schedule to those presenting the units. You will note the word "Break" on the instructional outlines, this can be a coffee break, or a week or more delay, again based on local conditions. The only limitations are those imposed by good educational practices.

Guidelines for Presenting Units of Instruction

Most educators believe that, "In general learning activities should be planned so that the learner is able to . . . ". In preparing to implement these units of instruction, it might be helpful to plan according to the sample design presented here.

General Goals

To enable a faculty member to examine his role and performance as a teacher with a new and informal perspective -

Specific Objectives

1) be able to formulate (write behavioral objectives in terms of student outcome)
2) plan effective learning activities to implement the behavioral objectives. Specifically, the faculty member should be able to a) choose and b) sequence the learning activities that will achieve his objectives at an acceptable level of competence
3) know available methods of evaluation

Sequence of Activities

1) Overview of goal and what you want them to be able to do
2) Group into pairs to develop a sequence of activities for the state general objective 20-30 mins.
3) Put several sequences on the board and discuss the likelihood that each would result in achieving the goal
4) Identify their own general goal, specific objectives and sequence for a short unit of instruction

I. The above specific behaviors contain three elements: terminal behavior of the student; conditions under which the behaviors will be performed; and the degree of proficiency expected of the student.

In doing this section, it helps to just briefly discuss the format of the general instructional objective and related specific behaviors and assure participants that you just want them to have a feel for it at this time, not a mastery--and that you'll get back to the details of it later. The part you want to emphasize in this session is the sequence of learning activities.

Suggested outline for a lecturette on sequencing emphasizes four points which may be used with participants:

1. Think in terms of process, not content, that is, the steps you would want to go through to achieve the general instructional objective rather than the content one should master;
2. Say to yourself, "If I were the student, what sequence or set of activities would most likely to insure that I would achieve the general instructional objective?"
3. Ask yourself, after developing your sequence, is it likely that you would be able to perform the specific behaviors you identified as your test if you went through the sequence? and,
4. Apply the checklist to your sequence, make any necessary revisions.

II. After discussion of above, have them pair and develop a sequence to achieve the general instructional objectives "uses principles of interviewing . . .".

General Instructional Objectives

Uses principles of interviewing to conduct initial interviews with new patients.

Specific Behaviors (Evaluation)	Sequence of Activities
1) Analyses six video-taped interviews with a variety of new patients in a manner that is at least 80% in agreement with that of experts	1) Process, not content 2) If I were the student
2) Conducts satisfactory initial interviews with six randomly selected new patients in a hospital setting in such a way that at least 80% of the behaviors judged essential by experts are evidenced.	3) Is it likely 4) Checklist

Tell them to be sure to go through the four steps above.

After 20-30 minutes, put a couple of sequences on the board; discuss in terms of the likelihood that each would result in the achievement of the objectives. Emphasize that probably each pair has a different sequence; there is no one best sequence; final test must be whether or not students can do the specific behaviors, pass the test as it were.

III. Key points of this session:

1. Multiple modes of instruction are necessary to achieve complex objectives;

2. No one sequence is best; can use as guide, our own experience and generally accepted principles of learning;

3. Final test is, can students do what you said they should be able to do, i.e., perform specific behaviors;

4. Organizing instruction in terms of systematic planning procedure, can influence teaching behaviors;

5. Procedures we're working with are applicable to course, unit, 1 hour of instruction, or even 15 minutes of instruction, the notion of specifying objectives in terms of expected student outcomes, developing a sequence of learning activities, as opposed to a lecture, for example, and specifying some behaviors that represent application of the knowledge acquired to real or close to real situations; evaluation.

CHARACTERISTICS OF DESIRABLE LEARNING ACTIVITIES

These statements generally reflect accepted principles of learning. This list is not complete, nor are the statements listed in a particular order.

IN GENERAL, LEARNING ACTIVITIES SHOULD BE PLANNED SO THAT THE LEARNER --

* is an active participant; not a passive receiver.

* will see relationship between planned learning activites and specified instructional objectives.

* gets satisfaction from correctly carrying out the behaviors implied by the instructional objectives. Reward for success will facilitate learning better than will punishment for a failure.

* will achieve the specified objectives within the period of time allocated.

* can practice the learned behaviors in varied contexts in order to determine the limits of generalization.

* participates in setting goals for himself.

* can deal with conflicts and frustrations that inevitably arise in both the process and environment of learning.

* can see the rational order of activities - simple to complex.

* is encouraged to think divergently to find innovative solutions.

* can observe the skills that are to be learned being correctly performed - has a model - before he attempts them himself.

* knows in advance what he is expected to learn and why it is relevant for him to learn it.

* can periodically practice using his new knowledge and skills to firmly fix the learnings.

* receives immediate feedback about his performance.

* knows the level of competence he is expected to achieve for each instructional objective.

* can regularly reflect upon his learning progress and problems.

CHECKLIST

FOR ASSESSING THE DESIRABILITY OF PLANNED LEARNING ACTIVITIES

The questions below reflect generally accepted principles that should be taken into account when planning student learning activities.

Once you have defined your instructional objectives, and tentatively formulated learning activities to achieve then, it is suggested that you follow the procedures outlined below before finalizing your plans.

Place a check ( ) next to each question listed below that you feel you can clearly answer YES.

For those questions for which your answer is clearly NO or for which you are uncertain about your answer, do one of the following:

(a) Review the learning activities you have planned and revise them so that you can answer YES to the questions; or,

(b) Articulate for yourself your rationale for not planning learning activities in terms of the ideas expressed in those questions.

1.______ Are the learning activities I have planned clearly related to the instructional objective(s) I have specified?

2.______ Am I clear in my own mind about the level of competence I want students to achieve for the objective(s) I have specified?

3.______ Are the learning activities I have planned comprehensive enough so that it is reasonable to expect that students will achieve at the level of competence I desire?

4.______ Have I made adequate provision in my plans to make sure that students will understand at the outset the level of competence I expect them to achieve?

5.______ Have I made adequate provision in my plans to make sure that students will understand the relevance of my objective(s) to their own interests/needs?

6.______ Have I planned for students to be actively involved in learning rather than passive listeners or viewers?

7.______ Will students have adequate opportunity to observe the knowledge or skill to be learned being correctly used in context?

8.______ Has adequate provision been made for students to practice using the knowledge or skill to be learned with careful supervision, receive immediate feedback on their performance, and practice again until the desired level of competence is reached?

9.______ Has adequate provision been made for students to reflect upon, digest, discuss, and challenge the experiences provided?

10.______ Will students have opportunities to use the knowledge or skill learned in new ways, that is, have I structured the learning activities to allow for divergent thinking which can lead to innovation solutions to problems?

11.______ Will students have adequate opportunity to discuss their efforts to do (10) above?

12.______ Have I planned the learning activities so that students will be able to achieve reasonably immediate satisfaction/reward for their efforts?

13.______ Is it reasonable to expect that students can learn what I expect them to learn in the allocated period of time?

14.______ Have I anticipated the conflicts and frustrations that students are likely to experience in the course of learning what I want them to learn and adequately prepared to deal constructively with them?

15.______ Have I organized the learning activities so that they are obviously rational rather than arbitrary and meaningless?

16.______ Have I made provision for students to set goals for themselves in addition to the goals I have prescribed?

17.______ Have I planned a variety of activities in order to reinforce learnings I want to occur?

18.______ Have I planned to implement the learning activities I have planned with a view to assessing their effectiveness, that is, the degree to which they result in students achieving what I want them to achieve?

19.______ Have I made provision in my plans to record unanticipated consequences of the learning experiences I provide?

20.______ Have I reviewed my plans with at least one colleague whose opinions I respect and modified them in terms of feedback received?

Instructor's Notes

Introduction

The suggested situations and instructional outlines contained in this manual are simply that--suggestions. It is anticipated that each user will modify these materials for his own specific setting and specific purpose. Additional uses, new applications, and innovative developments, hopefully, may occur to the user with greater familiarity and experience.

General Outline

Each learning unit is designed as a relatively autonomous one, requiring neither a specific antecedent nor follow-up unit. Most are accompanied by at least one instructional guide, designed primarily to serve as a model for further development as dictated by the local situation.

To help you develop some skills in lesson planning, the "Guideline for Presenting Units of Instruction" and "Characteristics of Desirable Learning Activities" are included for your use. You may wish to distribute these later to participants, but their primary purposes are to sharpen your skill before presenting any of the learning units and provide a well organized initial presentation.

Within each learning unit are several adjunctive parts which may be varied according to local conditions. While the number of parts may differ from unit to unit, they typically include:

1) A "Trigger Film" designed to be used according to the generalized film guide as an initiator for discussion. Since this is a relatively new technique, a film guide outlining the goals and objectives of the trigger films developed for use with these materials is included as Appendix A.

The film guide discusses the way in which these films may be used; some are designed for very specific learning units, but may be adapted to other appropriate uses.

2) An instructional guide pointing out research data, general comments on the topic and/or a list of references to other educational works that may have bearing on the lesson unit intended primarily for background information.

3) A brief article or monograph written by an authority in the field, that is especially pertinent to the lesson unit.

Guidelines for Presenting Units of Instruction

Most educators believe that, "In general learning activities should be planned so that the learner is able to . . . ". In preparing to implement these units of instruction, it might be helpful to plan according to the sample design presented here.

General Goals

To enable a faculty member to examine his role and performance as a teacher with a new and informal perspective -

Specific Objectives	Sequence of Activities
1) be able to formulate (write behavioral objectives in terms of student outcome).	1) Overview of goal and what you want them to be able to do
2) plan effective learning activities to implement the behavioral objectives. Specifically, the faculty member should be able to a) choose and b) sequence the learning activities that will achieve his objectives at an acceptable level of competence	2) Group into pairs to develop a sequence of activities for the state general objective 20-30 mins.
3) know available methods of evaluation	3) Put several sequences on the board and discuss the likelihood that each would result in achieving the goal
	4) Identify their own general goal, specific objectives and sequence for a short unit of instruction

I. The above specific behaviors contain three elements: terminal behavior of the student; conditions under which the behaviors will be performed; and the degree of proficiency expected of the student.

In doing this section, it helps to just briefly discuss the format of the general instructional objective and related specific behaviors and assure participants that you just want them to have a feel for it at this time, not a mastery--and that you'll get back to the details of it later. The part you want to emphasize in this session is the sequence of learning activities.

4) An instructional sequence showing one suggested break down and outline for teaching the unit.

5) An evaluation method or instrument designed for use in evaluating local effects in the area being discussed.

Again, these may be used in a number of ways depending upon the resourcefulness of the local staff person conducting the series. For example, the negative "feedback" film is equally appropriate as an introduction to one-to-one teaching. It should also be noted that the instructional sequences are not related to a time constraint. Since a variety of local circumstances may impinge on the way in which materials are developed, it was thought best to leave the actual time schedule to those presenting the units. You will note the word "Break" on the instructional outlines, this can be a coffee break, or a week or more delay, again based on local conditions. The only limitations are those imposed by good educational practices.

Suggested outline for a lecturette on sequencing emphasizes four points which may be used with participants:

1. Think in terms of process, not content, that is, the steps you would want to go through to achieve the general instructional objective rather than the content one should master;
2. Say to yourself, "If I were the student, what sequence or set of activities would most likely to insure that I would achieve the general instructional objective?"
3. Ask yourself, after developing your sequence, is it likely that you would be able to perform the specific behaviors you identified as your test if you went through the sequence? and,
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Instructor's Notes

Your Group Process

Even groups in which individuals believe they know each other well often need help to avoid talking at rather than to each other. The first step in reducing this problem is to make people aware of it, and help them overcome it. One way to do this is with practice.

The materials which follow are designed to be used first to assist your group to develop better group process.

Instructional Aids

The following materials are available:

Trigger films: Poor group process

Handouts: "On Being A Resource to Colleagues"

"Guidelines for Listener or Facilitator"

"Guidelines for the Speaker or Person on Focus"

You may need: Video or Audio tape recorder

Instructional Outline

Trigger Film: "Poor Group Process"
or
"Poor Feedback"

Advance Organizer: "On Being A Resource to Colleagues" should be distributed one week before session

Practice as outlined in the resource handout.

Compiled by:

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Assoc.Prof.,Beh.Sci.
George Williams College

WHAT IS GROUP PROCESS

All of us have spent much of our lives in various sorts of groups ---- the family, classroom, athletic team, work group, etc. Rarely have we taken the time to stop and observe what was going on in a group beyond noting the topics discussed and the outcomes of this discussion. Our knowledge of why individual members behave in a certain manner or why meetings turn out the way they do is indeed sparse. Again, one of our main goals is to become better observers, participants and leaders of groups.

When we observe what a group is talking about, its various topics of discussion, or the task upon which the group is working, we are focusing on the *content*. When we observe how a group handles its communications, its relationships, while the group works we are focusing on group *process* or group dynamics. Questions referring to group content usually use the word "what" (for example, *what* did you talk about?). Questions highlighting group process often begin with the word "how" (for example, *how* did you make that decision?).

All collections of people that are organized enough to be called groups have potentially observable patterns of group process. And whether observed or not the nature of the group processes affects the degree of success that groups have in achieving their tasks or in maintaining their existence in a manner that yields satisfaction to its members. Awareness of group process better enables one to diagnose group problems early, to deal with them more effectively, and to provide a more likely possibility that the group will function successfully.

Group processes occur in all types of groups and the majority of the process dimensions presented below apply to groups that are formal or informal, those that are for play or work and to those that are temporary or permanent. Therefore, the process skills imparted here will make you more effective in the variety of groups in which you participate.

DIMENSIONS OF GROUP PROCESS

Below are some observation guidelines to help you analyze group process behavior:

A. PARTICIPATION

One indication of involvement is verbal participation. Look for differences in the amount of participation among members.

1. Who are the high participators?

2. Who are the low participators?

3. Are there shifts in participation? For example, highs become quiet; lows suddenly become talkative. Do you see any possible reason for this in the group's interaction?

4. Who talks to whom? Do you see any reason for this in the group's interactions? Who talks after whom, or who interrupts whom?

5. Whom do people look at when they talk?
   a. Single others, possibly potential supporters.
   b. The group.
   c. No one. (Why so?)

6. How are the silent people treated? How is their silence interpreted? Consent? Disagreement? Uninterested? Fear? Etc.

7. Who keeps the ball rolling? Why?

B. INFLUENCE

Influence and participation are not the same. Some people may speak very little, yet they capture the attention and have an impact on the whole group and the direction it takes. Others may say a lot but are generally not listened to by other members.

1. Which members are high in influence? When they talk others seem to listen.

2. Which members are low in influence? Others do not listen to or follow them. Is there any shifting in influence?

3. Do you see any rivalry in the group? Is there a struggle for leadership? What effect does it have on the other group members?

C. STYLES OF INFLUENCE

Influence can take many forms; it can enlist the support or cooperation of others or alienate them. How a person attempts to influence another may be the crucial factor in determining how open or closed the other will be toward being influenced.

1. One-up: Attempts to impose his will or values on others. The rationale he uses for this behavior is his greater age, experience, expertise, etc. He tries to push members to support his decisions. Evaluates or passes judgment on others. Blocks action when it is not moving in the direction he desires. Pushes "to get the group organized".

2. One-down: Deferential toward others; gives them power. Eagerly supports other members' decisions. Tries to avoid conflict or unpleasant feelings from being expressed by agreeing with others or by pouring oil on troubled water (with humor, diverting attention from conflict by topic shifting, denying differences that exist between members, etc.).

3. Democrat: Assumes everyone can make a contribution to the group's efforts. Tries to include each member in a group's discussion or decisions. Expresses his feelings and opinions openly and directly with a minimum of judging others. Open to hearing the impressions others have of him. When feelings run high and tensions mount, he deals with the conflict in a problem-solving manner.

4. Drop-out: Tries not to be influenced nor to influence others. Appears to lack involvement in the group. Has difficulty commiting himself to making or accepting group decisions. Participates mechanically and only in response to another's question. When he talks he negates what he asserts, speaks tangentially or generally it is difficult to know just what his opinions are.

D. DECISION MAKING PROCEDURES

Whether we are aware of it or not, groups are making decisions all the time, some of them consciously and in reference to the major tasks at hand, some of them without much awareness and in reference to group procedures or standards of operation. It is important to observe how decisions are made in a group in order to assess the appropriateness of the decision to the matter being decided on, in order to assess whether the consequences of given methods are really what the group members bargained for, and to see how the procedure affects implementing the decision.

Group decisions are notoriously hard to undo. When someone says, "Well, we decided to do it, didn't we?" any budding opposition is quickly immobilized. We can only undo the decision if we reconstruct it and understand how we made it and test whether the method was appropriate or not.

1. The Plop: Someone makes a contribution which does not receive any kind of response or recognition. For example, "I think we should begin the meeting now" . . . everyone continues their private conversations.

2. Self Authorized: Someone announces a decision and carries it out without checking with other group members. For example, he decides on the topic to be discussed and starts right in to talk about it.

3. Handclasp: One member supports another's suggestion and one or both of them carry it out. John Doe says, "I wonder if it would be helpful if we introduced ourselves?" "I think it would, my name is Pete Jones."

4. Majority Support: A majority pushes through a decision over other members' objections. Is a vote called for? Or are people polled individually for their position?

5. Consensus: An attempt to get all group members to participate in a decision. A genuine exploration to test for opposition and to determine whether opposition feels strongly enough not to be willing to implement a decision; not necessarily unanimity, but essential agreement by all.

Of course, some groups never reach a decision. They wander from one topic to another and may discuss endlessly.

E. MEMBERSHIP

A major concern for group members is the degree of acceptance or inclusion in the group. Different patterns of interaction may develop in the group which give clues to the degree and kind of membership.

1. Is there subgrouping? Sometimes two or three members may consistently agree and support each other or consistently disagree and oppose one another. To what degree do these subgroup events occupy the attention of the group as a way of gaining membership for its participants? Or some subgroups coalesce around rejecting the group, because of the group's membership or goals or procedures.

2. Do some individuals seem to be outside the group? They may be farther out of the group physically or have difficulty getting "air time". Do some members seem to be most "in"? They sit close in or lean forward or they have easy access to getting the floor.

F. FEELINGS

During any group discussion feelings are frequently generated by the interactions between members. These feelings, however, are seldom talked about. Observers may have to make guesses based on tone of voice, facial expressions, gestures and other non-verbal cues.

1. What signs of predominant feelings do you observe in the group's members: Anger, irritation, frustration, warmth, congeniality, affection, excitement, boredom, defensiveness, conflict, etc.?

2. Do you see attempts by group members to block the expression of feelings: Negative or positive ones? How is this done? Does anyone do this consistently?

G. NORMS

Standards or ground rules may develop in a group that have a strong impact on the behavior of its members. Norms usually express the beliefs or desires of group members as to what behaviors should or should not take place in the group. These norms may be clear to all members (explicit), or may operate below the level of awareness of the group members (implicit). Since norms may facilitate or hinder group progress, it is important that they be looked at (that implicit norms are made explicit) so that the group can decide if they wish to accept them.

1. Are certain content areas avoided in the group (for example, sex, religion, political views, talk about present feelings in the group, discussion of the leader's behavior, etc.)? Who seems to reinforce this avoidance? How do they do it?

2. Is conflict avoided when it occurs? Are group members overly nice or polite to each other? Are only positive feelings expressed? Do members agree with each other too readily? What happens when members disagree?

3. Are there norms about participation? (For example, "If I talk, you must talk." "We can only talk about our strengths and not our difficulties or vice versa." "We talk only about the person's ideas and not his personal style."

H. TASK FUNCTIONS

Behavior in a group can be viewed in terms of its function or purpose. Task functions refer to behaviors that are concerned with the group getting its job done. The varieties of behaviors that facilitate task achievement are described below:

1. Initiating: Proposing tasks or goals; defining a group problem; suggesting a procedure or ideas for solving a problem.

2. Seeking information or opinions: Requesting facts; seeking relevant information about group concern; asking for expressions of feeling; soliciting expressions of value; seeking suggestions and ideas.

3. Giving information or opinion: Offering facts; providing relevant information about group concern. Stating a belief about a matter before the group; giving suggestions and ideas.

4. Clarifying and Elaborating: Interpreting ideas or suggestions; clearing up of confusions; defining terms; indicating alternatives and issues before the group.

5. Summarizing: Pulling together related ideas; restating suggestions after the group has discussed them; offering a decision or conclusion for the group to accept or reject.

6. Consensus Testing: Asking to see if the group is nearing a decision; sending up a trial balloon to test a possible conclusion.

I. MAINTENANCE FUNCTIONS

These functions are important to the morale of the group. They maintain good and harmonious working relationships among the members and create an atmosphere which enables each member to contribute maximally. They insure smooth and effective team work within the group.

1. Gate Keeping: Controlling the channels of communication in two ways:
    a. Gate openers: Help keep communicating channels open; help others get into the discussion.
    b. Gate closers: Cuts off others or interrupts them.

2. Encouraging: Being friendly, warm and responsive to others; showing acceptance of others' contributions.

3. Compromising: When one's own idea is involved in a conflict, offering a compromise; admitting error; modifying in the interest of group cohesion or growth.

4. Standard Setting and Testing: Testing whether the group is satisfied with its procedures or suggesting procedures; pointing out explicit or implicit norms which have been set to make them available for testing.

ON BEING A RESOURCE TO COLLEAGUES

Whenever a group (more than one person) meets to work on a task, each person in the group brings common and unique resources into the situation. As long as all of these resources are being directed toward the solution of the same problem the group can work efficiently. Unfortunately, what frequently happens is that each member of the group brings his own problem and tries to make the group focus on his problem or that aspect of the assigned task which is important to him. This results in a "leadership" crisis, with each member trying to take the group in his personally important direction.

To illustrate:

Chairman of Curriculum Committee: "Our task today is to develop broad study guidelines for the junior students."
Member A: "I think our primary focus should be on improving patient care."
Member B: "I think our efforts should provide for more effective integration of the basic sciences."

Unless the chairman can keep this group working on the specified task, considerable energy and group time will be wasted as A and B try to convince the committee that their priorities are the most important.

Another way in which colleague or group resources are wasted is a result of a tendency for each of us to want to find solutions quickly. We frequently suggest solutions before we really understand the problem, and group energy is then consumed checking the validity of solutions instead of fully exploring the problem.

Why does this happen when all of us want to be helpful and efficient? Primarily because the ground rules for group interaction are vague and are subject to the many variables which influence social interaction, e.g., politeness, need for status and safety, hierarchies, and hidden agendas.

One demonstrated way of remedying this situation is to have the "ground rules" for interaction made explicit, e.g., assigning specific roles to various group members and specifying the exact behaviors which are required of each role; and by assigning time for each group member to have his agenda dealt with. If these "ground rules" can be specified and accepted at the beginning of the interaction, not only will each member feel more comfortable in knowing what his responsibilities are, it becomes much easier to provide feedback to a member who is getting in the way of group efficiency.

The simplest "ground rules" by which a group can operate are to have only two roles; a speaker or person on focus; and a listener or facilitator; and allow each person in the group an equal amount of time.

The following material describes more fully these two roles and indicates specific behaviors required of each role. It is our expectation that during the workshop each of you will be a resource to your fellow participants. This will require that you have certain basic skills, and if skills are to be learned they must be practiced.

The specific skills which this experience is designed to help you improve are:

1. the ability to listen
2. the ability to help colleagues clarify their own ideas
3. the ability to provide a safe environment for trying out new ideas
4. the ability to provide positive feedback

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Guidelines for Listener or Facilitator

1. The role of the facilitators is to listen attentively to the focus person, making every effort to fully understand his point of view and thinking. Questions should be asked primarily for purposes of clarification rather than to convey doubt about the wisdom of the focus person's ideas.

2. Once the focus person has provided an overview of his thinking and objectives, the facilitator should, prior to any discussion, identify the two or three issues the focus person would like help with during the session.

3. It is up to the facilitators to draw out the focus person around each of the objectives he has identifed as important to him. The purpose is to asisst the focus person to clarify and expand his thinking and not to tell him what he should do or not do. Such questions as the following are often useful in helping the focus person clarify the expression of his thoughts:

   a. "Can you give me an example of ....?"

   b. What experience have you had which led to this idea .....?"

4. It is the responsibility of each facilitator to see that the session stays focused upon the focus person and the issues that are important to him.

5. Although suggestions are sometimes helpful, more often than not the focus person will need help with his thinking more than he'll need specific advice about what to do. Keep advice to a minimum.

6. When the focus person's agenda has been covered and/or time has run out, it is useful if each facilitator tells the focus person what it is he particularly likes about both the approach he has planned and the way he has related to his colleagues in the session.

CED 1971

Guidelines for the Speaker or Person on Focus

1. Prior to meeting with your colleagues clarify your own thoughts on:

    a. the general task which you are trying to achieve.

    b. the specific ideas, problems, issues which you feel will influence task achievement.

2. When meeting with your colleagues:

    a. Present an overview of your thinking about the task, sharing not only what you have been thinking about, but why you feel they are important. Share these thoughts as comprehensively as possible so that your colleague (s) can fully understand your situation.

    b. Identify specific questions or issues which are of concern and require the consideration of colleagues. All parties involved are likely to become frustrated if you simply present ideas and ask for general reactions.

    c. When your agenda or time has been completed, it is useful if you indicate the specific ways in which your facilitator (s) was helpful to you.

CED 1971

Instructor's Notes

Developing Objectives

"What is it that you want me to know, do, see?" These are questions that can, and should be, answered before learners receive instruction. Such an introduction helps focus their attention on the task at hand, see the purpose for instruction, and better understand the basis upon which their performance will be judged.

The material presented here will help the staff see the need for specific objectives and give them some practice in preparing them. One final cautionary note: Perhaps the most significant learning that can come from this unit is not the objectives *per se*, but an understanding of the process by which the objective is developed.

Instructional Aids

The following materials are available:

Trigger Film:	"The Improperly Stated Objective"
Article:	"Preparing Instructional Objectives"
Handout:	"Defining Instructional Objectives"
You may need:	16 mm Sound Projector

Instructional Outline

Advanced Organizer: Distribute "Preparing Instructional Objectives" one week before the session.

Trigger Film: "The Improperly Stated Objective"

1) Discuss the lack of direction in problems posed by such elusive objectives.

2) You may wish to develop empathy by asking people to indicate how they would feel if they were students in this situation.

3) Use the check list (pages 5 and 6 of the attached material) to rate the use of objectives in the film.

4) Complete the application activities.

Session Two:

1) Discuss the application activities.

2) Apply the procedures shown on pages 5 and 6 of the attached material to these application procedures.

PREPARING INSTRUCTIONAL OBJECTIVES *

Typically, teachers, if they attempt to state instructional objectives, do so in terms of (1) the teacher's performance; (2) the learning process; or (3) the subject matter to be covered. For example, it would not be unusual to find the following as an instructional objective in many educational institutions: "To increase students' reading ability."

The problem with the above statement is that it focuses upon what the teacher wants to do. Technically, once the teacher had carried out whatever plan he had prepared to "increase students' reading ability", he would have achieved his objective and we would be left wondering whether, in fact, students had increased their reading ability.

The approach to preparing instructional objectives advocated here stresses focusing attention on the student and on the type of performance he is expected to demonstrate at the end of instruction. In other words, it is suggested that instructional objectives should be stated in terms of the desired learning outcomes. Following this suggestion, the above objective might reasonably read: "Comprehends assigned reading material." Note that this statement stresses what the student will be able to do after instruction rather than how the teacher will behave during instruction.

Stating instructional objectives as learning outcomes contributes to the instructional process in the following ways:

1. It provides direction for the instructor, and it clearly conveys his instructional intent to others.

2. It provides a guide for selecting the subject matter, the teaching methods, and the materials to be used during instruction.

3. It provides a guide for constructing tests and other instruments for evaluating student achievement.

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* Based on the work of Norman E. Gronlund as described in Stating Behavioral Objectives for Classroom Instruction.

Defining learning outcomes is really a two-step process:

1) Stating instructional objectives as general learning outcomes; and,

2) Listing, under each instructional objective, a representative sample of the specific types of student behavior that would indicate attainment of the objective.

Two examples are listed below, with the general learning outcome stated first, followed by representative samples of specific types of student behavior that might indicate attainment of the objective.

I. Understands the Meaning of Technical Terms.

   a. Defines the term in his own words.

   b. Identifies the meaning of the term when used in context.

   c. Distinguishes between terms that are similar in meaning.

II. Understands Basic Principles

   a. States the principle in his own words.

   b. Gives an example of the principle.

   c. Distinguishes between correct and incorrect applications of the principle.

Stating the general instructional objective first and then clarifying it further by listing types of specific behavior that characterize the objective makes clear that the instructional objective above is understanding, and that defining, identifying, and distinguishing between are simply samples of the types of performance that represent understanding. It would be impossible to list all types of behavior that might show understanding; therefore, one must settle for a representative sample of the types of behavior that, in the judgment of the teacher, adequately describe the objective.

Teaching efforts must be directed toward the general objectives of instruction and not toward the specific samples of behavior selected to represent each objective. For example, in teaching an understanding of technical terms, we might have students listen to a lecture, study textbook definitions, compare and contrast the terms during class discussion, and use the terms in laboratory work. When we test the students, however, we would present them with a list of technical terms and ask them to define each term in their own words, identify the meaning of each term when used in a context, and distinguish between terms that are similar in meaning. Note that the test calls for a type of response that was not directly taught during instruction. This is necessary if the test behavior is to show an understanding rather than merely a recall of previous training.

When developing a list of general instructional objectives for a course or unit of course work, the aim is to obtain a list of general objectives to work toward and not a list of specific types of behavior to be attained by all students. There are some kinds of words that are particularly useful in articulating general instructional objectives. Examples are listed below:

Applies
Comprehends
Knows
Understands
Uses
Appreciates
Thinks critically

Note that the above verbs are specific enough to provide direction for instruction without overly restricting the teacher or reducing the instruction to a simplistic level. They are also specific enough to be easily defined by a brief list of the types of behavior students are to demonstrate when the objectives have been achieved. Choosing from eight to twelve general objectives will usually provide a list that is both manageable and suitable for a unit of instruction.

When elaborating general instructional objectives so as to define specific learning outcomes, that is, identifying and listing under each objective a representative sample of specific types of behavior that are to be used as evidence that the objective has been achieved, it is important to use verbs that indicate observable behavior, that is, behavior that can be seen by an outside observer. Such words as the following are particularly useful:

Identifies
Describes
Lists
Relates
Explains
Predicts
Distinguishes
Formulates
Specifies

Words like realizes, sees, feels, suggests are less clear and therefore should be avoided.

To illustrate once again the relationship between a general instructional objective and specific learning outcomes that can be used as evidence that the objective has been achieved, consider the following example:

General Instructional Objective

Uses critical thinking skills in reading.

Specific Learning Outcomes (in behavioral terms)

Distinguishes between facts and opinion.
Distinguishes between facts and inferences.
Identifies cause-effect relationships.
Identifies errors in reasoning.
Distinguishes between relevant and irrelevant arguments.
Distinguishes between warranted and unwarranted generalizations.
Formulates valid conclusions from written material.
Specifies assumptions needed to make conclusions true.

Although this list of types of specific behavior is by no means complete, a careful reading of the statements will provide a fairly good indication of what students are like when they are able to use critical thinking skills in reading. Thus, this list is perhaps comprehensive enough to clarify the instructional intent and short enough to be manageable and useful.

During the process of defining the general instruction objectives, it may be necessary to modify the original list. In identifying the specific types of behavior for the objectives, you may realize that some of them are too general and need to be subdivided. An objective of problem-solving in arithmetic, for example, might better express instructional intent if it is broken down into computation skill and solving story problems.

In defining other objectives, you might note that the specific types of behavior overlap to such a degree that is desirable to combine two statements into a single objective. Thus, applies scientific procedures and plans simple experiments might best be combined into a single objective like uses the scientific method effectively.

Because instructional objectives can be stated in many different ways and at various levels of generality, there is considerable flexibility in the formulation of the statements. Thus, the listing of specific types of behavior provides a good opportunity for evaluating the original list of instructional objectives and for revising them if necessary. The ultimate aim, of course, is to derive a final list of general objectives and specific behaviors that most clearly indicate the learning outcomes expected from instruction.

One further note. Beware of neglecting those objectives that are difficult to define. Simple objectives like knows common terms are easy to state in specific behavioral terms. There is a tendency to overload the list of instructional goals with such objectives because they are so easy to define. The more complex objectives, although difficult to define, are usually more important from an educational standpoint. Objectives pertaining to thinking skills, attitudes, and appreciation should not be slighted because of the difficulty of clearly defining them.

In general summary, the procedure for defining instructional objectives should include the following steps:

1. State the general instructional objectives as expected learning outcomes.

2. Place under each general instructional objective a list of specific student behaviors that would indicate attainment of the objective.

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Teaching Techniques - Overview Unit

In order to select a specific technique for use in an instructional situation, the teacher must understand both the basic principles of learning and the strong and weak points of various instructional methods. This overview is concerned with some brief statements about both as a framework within which one may view the teaching/learning process. Subsequent lesson units will undertake a more detailed review of the positive and negative aspects of each of the technieques discussed here. Hopefully, the staff will be able to more skillfully utilize their time with students and more effectively use their skills and the materials available to them if they will keep the information presented here in mind. In this outline we will not discuss in any detail the use of teaching aids but, rather, limit ourselves to a review of the principles of learning and the major strengths and weaknesses of some selected teaching techniques.

Outlined below are ten principles of learning and five principles of teaching which are worth reviewing and applying to any specific teaching technique.

Principles of Learning

1. Learning involves a change in behavior of the learner.
2. . . . different people learn different things by different means and at different rates.
3. . . . learning is more efficient if the intermediate course goals are seen to be related to the final objective.
4. . . . success tends to raise a student's level of aspiration and failure to lower it, with the degree of movement roughly related to the degree of success or failure.
5. . . . emotion nearly as much as intellect is involved in the learning process.
6. . . . retention of information, of skills, of understanding or of attitudes is significantly increased if the learning is accomplished in a context which has meaning for the student.
7. The rapidity and the degree of forgetting can also be reduced by overlearning skills beyond minimal proficiency.

8. If efficiency and effectiveness of learning is an important goal, then there is a sound experimental basis for the efforts directed toward integration and correlation of subject matter.

9. Learning how to be a doctor and being one are obviously different things.

10. . . . more generalized training may also be transferred when there is similarity between the new situation and the one in which that behavior was learned as appropriate.

Principles of Teaching

1. Learning is personal.

2. Learning must be meaningful.

3. Learning must be aimed at realistic goals.

4. Learning should be accompanied by feedback.

5. Learning should be based on good interpersonal relationships.

Specific Techniques

LECTURE

Lectures are probably the most frequently used teaching techniques despite the fact that they are frequently used improperly. Experimental research indicates that the efficiency of the lecture as a method of simply transmitting information or illustrating the application of principles is equalled or surpassed by other methods of presentation. Nevertheless, lectures do have a place in teaching.

Generally, lectures should be limited to those situations in which the time is spent either expanding a philosophy or outlining a model for subsequent learning situations. They are also useful for transmitting general or course overview information since lectures are best used when information, rather than understanding, is to be communicated.

The time spent in lecturing is extremely critical. Lectures can catch an audience's attention. but studies have shown that the ability of the audience to recall information drops precipitously after approximately fifteen minutes of lecturing. Consequently, long lectures (one hour or longer) are extremely inefficient. Lectures are probably best used with large groups of students or listeners in which general information is to be communicated in a relatively short period of time. Their major disadvantage is that they do not allow for learner feedback and are difficult to evaluate.

DISCUSSION GROUP

Discussion groups are particularly appropriate when:

a) The time spent is directed toward giving students opportunities to understand differences and to formulate principles in their own words.

b) The students are allowed to synthesize solutions to problems based on information previously given.

c) The present attitudes of students run counter to previously held beliefs.

d) It is desirable to provide a situation in which immediate feedback is available to both the teacher and the student on their performances at that moment.

In contrast with the lecture, discussion groups are excellent when the understanding of principles or the application of principles is the goal. scussion groups are not particularly efficient when basic information is to be transmitted since there is too much two-way communication, which results in frequent interruptions by discussion, inquiry, etc. Discussions in small groups (four to eight people) have also been found to be much more efficient in producing long-term retention or changes in attitudes than some other forms of teaching. Small discussion groups, however, impose a bit more strain on the teacher or leader. The leader must, first of all, start the discussion of the group and control it so that the group goals are attained. There are several tips that a teacher should keep in mind when they are using the discussion group technique:

1) Teacher should avoid phrasing questions to the group that obviously have one right answer. So far as questions of fact are concerned, lectures are more efficient in accomplishing this than discussions. Consequently any questions that the leader uses should be structured to get at relationships, application, analysis of data.

2) Discussion questions used by the leader should be meaningful to the students. This assumes that the leader is aware of the students' backgrounds and their level of knowledge when they first come into the discussion group. It should be obvious that the discussion group among Board certified surgeons would be handled entirely differently from that of covering the same content material, with third-year medical students. Optimally, questions should be formulated at a level at which students are able to relate. It is only in this way that they can use their own experiences to enter these discussions.

3) Disagreement within a discussion group is by no means a sign of failure, but can be used constructively provided that hostility, itself, does not actually arise. It has been found that a certain degree of uncertainty arouses curiosity, a basic motive for learning. Disagreement, when used skillfully and in a non-threatening manner, can be an extremely efficient method of keeping a discussion group going.

4) The essence of a discussion group is participation by all present. For some purposes wide spread participation may be vital, for others it may be less important. What is important is that the leader maintain a climate in the group, such that important contributions are made because the participants feel free to express themselves.

5) In a good discussion group the leader is extremely sensitive to the dynamics of the group. He must regain attention when it is lost, dampen hostility, and fend off diversionary questions without shutting off discussion. He must avoid telling the participants an answer or giving them a solution before they, themselves, have developed one. He must be able to handle a group which is in total agreement and, consequently, may come to a halt in the course of a discussion, as well as handling a group in which arguments arise.

6) A note should be made of the fact that discussion groups are not necessarily limited to small numbers of participants. Specific techniques can be used for larger groups. However, for most small groups, discussion is a method f teaching that can be extremely efficient with regard to the application or understanding of basic principles. A good discussion group is an excellent stimulus to further learning.

INDIVIDUAL ENCOUNTERS

A not uncommon teaching technique, although frequently not recognized as one, is the so-called individual encounter. Attendings frequently have occasion to sit down with the resident, intern, or colleague, and go over material with which both are familiar. This does not mean that all such encounters can be considered teaching situations; but it does mean that the attending staff must be cognizant of the fact that unless carefully used, such an individual encounter is not particularly efficient. This is due primarily to its informality since considerable time may be lost for just that reason.

An individual encounter is an excellent time in which to obtain feedback on more structured teaching techniques. This time could be used to determine whether or not the objectives of a lecture, group discussion, or rounds, have been accomplished by direct evaluation of the individual.

The principles that apply to other teaching techniques apply equally to individual encounters. The advantage of an individual encounter is that the learner/teacher ratio is obviously one-to-one. A great deal of individual attention can be given to the learner. Much of the time can be spent identifying individual problems and providing assistance in their solution. Additionally, individual evaluation is also possible.

The major problem in an individual encounter is the personal interaction. If the individuals involved spend their time vying for position or jostling with each other working out interpersonal relationships, the educational value of the time spent is nullified.

ROUNDS

The format used in rounds varies from program-to-program and sometimes from service-to-service within a program. The major difference between rounds and other teaching techniques is that there is usually a patient, chart, and frequently x-rays available to the teacher and learner. It may be well, at this point, to indicate the different kinds of rounds which are available.

So-called work rounds are basically that, attempts to transmit large amounts of information related directly to service requirements. Using these sessions for teaching purposes is very inefficient and not particularly desirable. Usually there is far too much to be done on work rounds, and time spent disecting problems and synthesizing solutions to them presents a full-time activity. Optimally, work rounds and teaching rounds should be kept separate and distinct. This does not preclude some teaching on work rounds, but it does recognize the fact that the primary purpose of work rounds is work.

Teaching rounds, on the other hand, should not be confused with work rounds. Physical settings may even be very different. Hopefully, they will be, since the discussion of a specific patient's case in a large ward or in front of other patients is extremely poor practice. Optimally, teaching rounds should be held where a certain amount of privacy can be maintained and at the same time permit the group to take advantage of the presently available patient material. The advantage of teaching rounds is that the patient is actually there; he can be questioned, the physical findings can be elicited, findings and history can be correlated, the laboratory and x-ray data are (or should be) available. In effect, this is a group discussion teaching situation with the addition of the patient. The patient, himself, can be taken into the discussion which can prove to be educational for the attendings, the house staff, the students, and also the patient. Teaching rounds are excellent situations for teaching the students and the residents the art of medicine. The atmosphere is set by the teacher. The teacher expects his students to treat patients in a certain fashion. He has an excellent opportunity to teach by example during teaching rounds.

The same basic educational principles apply, the specifics of teaching rounds will vary depending on the patient load, physical plant, equipment available, and the time available.

SELF-INSTRUCTION

Self-instruction is becoming a greater necessity as time goes on. In terms of a teaching situation, self-instruction can be used by the attending staff to keep up with recent developments, and by the house staff to supplement other teaching techniques that are being applied to them. More important than anything, perhaps, is the installation of attitudes concerning self-instruction to the staff by the teacher. As in many situations, example is the best teacher, consequently, the teacher's familiarity with self-instructional methods and techniques, should be communicated to students.

Again the same basic principles apply. To use self-instruction equipment and modalities properly, one must have some concept of how one learns best. This may determine whether or not audio tapes, audio-visual methods, text books, articles, lectures, etc., are emphasized in one's self-instruction program. Optimally, some kind of evaluation should be incorporated for feedback purposes in the self-instruction program. This can best be done by formulating a pre-test, then using a self-instruction method and comparing performance before and after the experience.

The big defect in self-instruction is the inherent difficulty of obtaining appropriate feedback. Consequently, a self-instruction program without some method of obtaining feedback is inefficient. A good self-instruction program should use methods which allow for evaluation and feedback during the couse of the program.

ANALYSIS OF TEACHING PERFORMANCE

1. What do you think the teacher wanted the students to feel, think, and/or be able to do at the end of this segment?

2. Now, forget for a moment what the teacher actually did. Think instead about what sequence of activities/experiences would have made it possible for you, had you been a student in the situation, to reach the above objective. List that sequence below.

   1)____

   2)____

   3)____

   4)____

   5)____

3. If you had experienced, as a student, the sequence you identified above, what might the teacher have had you do at the end of the sequence to convey that the specified objective had been reached. Please be specific. Describe one or two behaviors the teacher might have requested from you.

4. Now, think again about the teacher. List below those activities/experiences that you identified in (2) above as desirable that the teacher both did and did not provide.

Did Provide	Did Not Provide
____________________	____________________
____________________	____________________
____________________	____________________
____________________	____________________

Did Provide	Did Not Provide

5. Thinking again about what the teacher did, describe what, if anything, was done to determine whether or not the objective of the session had been achieved.

6. List three adjectives that you feel describe the teacher's style. Whenever possible, give examples of things the teacher said or did that made you use the adjectives you chose.

7. Think once more about yourself as a student in this situation. List three adjectives that you feel describe the teaching style that would best help you achieve the specified objective.

SOME TECHNIQUE TERMS

COLLOQUY

A colloquy is a modification of the panel using six to eight persons, three or four representing the audience and three or four resource persons or experts (if only one resource person is available, proceed with him). A moderator directs the proceedings. The colloquy members, selected from and representing the audience, ask questions, express opinions, and raise issues to be treated by the resource person. The audience listens, but occasionally they may participate under the guidance of the moderator.

COMMITTEE

A committee is a small group of persons appointed or elected to perform a task that cannot be done efficiently by an entire group or organization, or done efficiently by one person. The most common use of the committee is to plan and evaluate educational activities and to act in advisory capacity to persons directing programs.

DEMONSTRATION

A demonstration is a carefully planned presentation that shows how to perform an act or use a procedure. It is accompanied by appropriate oral and visual explanations, illustrations, and questions. First the learners watch an expert perform the demonstration and listen to explanations. Then the demonstration is followed by practice opportunities for the learners.

FIELD TRIP

A field trip is a carefully planned educational tour in which a group visits an object or place of interest for first-hand observation and study.

FORUM

A forum is a 15 to 60 minute period of open discussion that is carried on among the members of an entire group (usually larger than 25 persons) and one or more resource persons. The forum is directed by a moderator. It should be noted that the forum is not a question-answer period, but rather a guided discussion during which the audience is encouraged to raise questions, make comments, discuss issues, and make observations.

GROUP DISCUSSION

Group discussion is a purposeful conversation and deliberation about a topic of mutual interest among six to twenty participants under the guidance of a trained participant called a leader. It is a technique that offers maximum opportunity for the individual learner to share his ideas and experiences with others. If people fail to accept their responsibilities or are untrained in this technique, enlightened conversation will give way to debate, argument, or a pooling of ignorance. The entire group should have training in the fundamentals of participation of which leadership is a part.

INTERVIEW

The interview is a 5 to 30 minute presentation conducted before an audience in which one or two resource persons respond to systematic questioning by an interviewer about a previously determined topic. The interviewer asks the resource person(s) questions designed to explore various aspects of the topic and improvises questions as the interview progresses. The resource person has been informed in advance about the kind of questions he will be asked, but no rehearsal of the interview has been held.

PANEL

The panel is a group of three to six persons having a purposeful conversation on an assigned topic. The panel members are selected on the basis of previously demonstrated interest and competency in the subject to be discussed and their ability to verbalize in front of an audience. The conversation is guided by a moderator who has prepared questions to start and sustain the discussion. The audience watches and listens but does not participate verbally. A panel usually lasts from fifteen to forty-five minutes.

QUIET MEETING

A quiet meeting is a fifteen to sixty minute period of meditation and limited verbal expression by a group of five or more persons. Periods of silence include meditation, concentration, and study about a topic which has been placed before the group on a blackboard or easel. Freedom of expression is strongly encouraged. When a participant wishes to share an idea, opinion, or reaction of any kind, he speaks. The participants do not necessarily react to or build upon each other's contributions as they do in group discussion. Also, they are under no obligation to talk. The quiet meeting is a group of non-strangers.

ROLE-PLAYING

Role-playing is a spontaneous portrayal (acting out) of a situation, condition, or circumstance by selected members of a learning group. Role-playing emphasizes relationships among people. Role-playing is done by members of the learning group who try to portray typical attitudes, rather than by persons having acting abilities. After a problem or situation has been illustrated by role-play, the learning group discusses and interprets the action through the use of another technique such as group discussion.

SEMINAR

The seminar is a group of five to thirty persons engaged in specialized study and led by a recognized authority in the subject being studied. The study may be relatively advanced in nature, with each seminar member doing individual studying and reporting as suggested by the director. Usually the members prepare written or oral reports which they share with each other.

LECTURE

A lecture is a carefully prepared oral presentation of a subject by a qualified person. It is frequently referred to as a speech.

SYMPOSIUM

A symposium is a series of related speeches by two to five persons qualified to speak with authority on different phases of the same topic or on closely related topics. The speeches vary in length from three to twenty minutes, depending on the number of speeches, the amount of time available, and the topics to be treated. The speakers do not converse with one another; they make presentations to the audience. A chairman is in charge of the symposium.

Instructor's Notes

Teaching Technique - Specific Methods

The Lecture

Perhaps the oldest form of instruction is the lecture. While it is condemned in some circles and defended in others, the fact remains that lecturing is still the most popular way of transmitting information.

Even the best lecture can be improved. First, careful organization and preparation can improve the content--the transmittal. Next, a new, and perhaps, innovative use of ancillary materials can heighten the interest level; and finally, careful appraisal of the lecturer's behaviors can help uncover areas of needed improvement. This lesson seeks to illustrate these three steps.

Instructional Aids

The following materials are available:

Trigger Film: "Ineffective Lecture"

Article: Johnson, Rita B. - Ed.D. "The Lecture: Can It Be Improved?"

Handout: Lecture Rating Form

You May Need:

16mm Sound Projection
Video or Tape Recorder - Play Back Equipment
Overhead Projector

Instructional Outline

Trigger Film: "Ineffective Lecture" followed by discussion.

1) "The Lecture: Can It Be Improved?" can be used as a basis for a lecture demonstrating effective lecture technique.

2) Completion of the rating scale by participants.

3) Discussion of ratings.

- BREAK -

Advanced Organizer:

1) Assign five minute "mini-lecture" on topics of interest for next session. Lectures should be based on things which interest the lecturer and not be limited to medicine.

2) Tape (video or audio) mini-lectures, have staff complete the check list. Participants should be encouraged to disregard specific content when evaluating the mini-lecture.

3) Discuss each presentation briefly after having them review their own tape. This can best be done in single session, rather than a group.

4) Present revised five minute "mini-lectures" to group.

THE LECTURE: CAN IT BE IMPROVED?

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THE LECTURE: CAN IT BE IMPROVED?

Rita B. Johnson

It is widely accepted that no one method of instruction is necessarily better in all situations than any other. As teachers, we have all conducted poor lectures as well as good ones. Role-plays, discussions, seminars, field trips, games, laboratory exercises and projects can be stimulating or deadly.

On the other hand, there is no one method of instruction used more widely by us in this country at all levels and institutions than the lecture. Despite exhortation, persuasion, student riots, and administrative fiat, the lecture or the spoken word still is the nation's favorite method of dispensing information.

Let us assume then that as a teacher you plan to continue to lecture to your students. You may be using the lecture as the ONLY method, or you may be using it in combination with other methods to stimulate, arouse, inspire, clarify or amplify. In any case, several things might be done to improve any given lecture. Below is a list of a dozen suggestions which might improve student learning. Try some of these techniques and see!

1. Don't attempt to "cover material". Try instead to change student performance. Focus on the task to be accomplished as an outcome of the lecture.
2. Focus on student performance or task, instead of on your own. What is the student going to do, think, believe or say at the end of the lecture, that he couldn't do, think, believe or say before the lecture was given? This should be your objective.

3. Tell the student your objective. Let him know what he is supposed to do (mentally or physically) as an outcome of the lecture.
4. Tell your students why the objective is important to him. How will it help him on the job, in school, or at home? He needs to know how it is relevant or meaningful to him.
5. Pretend you are talking to only one or a few persons. Make your talk personal. You really are talking to one person at a time, since each person in the audience is listening to you independently.
6. Move the student from simple, basic or familiar tasks to the more difficult or unfamiliar, e.g., give him concrete illustrations at first, and later deal with the more abstract or symbolic material.
7. Break the material into short sections. After a certain amount of information: (a) ask him a question related to the material just covered; (b) request that the student write the response to that question; (c) immediately give him the right answer. If there is no "correct" answer give him a way to judge whether or not he was on the right track. Let him know if he was successful. Give him a chance to correct his errors.
8. Again, remember to stop often and have the student respond in writing to your question. Then tell him the answer so he'll know if he responded correctly. These three steps (i.e., asking a question about the material, having the student respond, and

telling him if he responded correctly) will probably improve his effectiveness markedly. A handy formula is:

   a. Tell your students what they're to do.
   b. Let them do it.
   c. Tell them if they did it.

9. Use visual images and concrete aids whenever you can. Diagrams, sketches, slides, and transparencies are helpful. Whatever you do, substitute visual aids for the nouns or objects in your speech. Substitute flow charts, graphs, diagrams or films for verbs to show action or movement in your speech. Your words are much less effective when used alone.
10. Ask a simple question or two at the end of your lecture to find out how effective you were. Collect the papers and check the responses. (That's right, find out how effective you were! After all, if you did a good job, nearly all of your students should pass this little post-test.)
11. If you dare, ask your students to evaluate your lecture anonymously. Distribute some interview-type questions following your presentation. Ask the students if they were bored or stimulated, confused or helped, discouraged or inspired, etc.
12. Analyze the data you receive from your post-test and interview questions. Which portion of your lecture needs improvement? Which portion is now working effectively? Change what isn't working well. Keep doing what is effective.

Now that you are thinking about ways to alter the lecture, you might also consider the following more drastic procedures:

1. Bring a tape recorder in to your lecture session. Turn it on before you begin. After your lecture is over, put the tape in the library for those students who missed your lecture or who want to hear it a second time.

   Want to be even more daring? Tell your students they don't have to come to class. If they want to go to the library on their own to hear your tape, let them. Then test all of your students at the end of the course. See if those who don't come to hear your lecture in person do just as well as those who do.

   You may be surprised at the results. Some teachers find the students who work on their own do just as well without the teacher. Why? Probably because the students can go to the tape:

    a. when they are ready for it, and

    b. as often as necessary.

2. Write out your post-test or final exam for a given unit of work. Split the test up into two alternate sets of items, so that both exams measure the same skills.

   Give one set of items to your class before you begin your lecture. Test them after the lecture on the other set of items. Your class will probably do better, just because they know what to focus upon when they listen. (You may be thinking, but then they'll know what to look for and they might get all the answers right. You are correct!)

3. Give your class a set of worksheets to follow which they can fill out as you speak. Let them take notes on these sheets. Your key words, phrases or questions will force them to attend to what you believe to be most important.

Below is an example of such a worksheet for this article:

THE LECTURE: CAN IT BE IMPROVED?

I. Which method of instruction is best?

____

____

II. Twelve ways to improve student learning:

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________
11. ____________________
12. ____________________

III. More drastic procedures for altering the lecture:

1. ____
2. ____
3. ____
4. ____
5. ____

IV. Dr. Johnson's address:

____

4. At the beginning of each lecture pass out the following:

   a. objectives

   b. sample test items on the lecture

   c. practice questions or exercises based on the lecture

   d. answers to the practice questions

5. Most daring of all, perhaps, convert your entire lecture to a self-instructional booklet or tape. Let the students read it or listen and look at it on their own, at their own rate, whenever they feel like it. This will leave you free to become a TUTOR, to stimulate, arouse, answer their questions, and clear up confusion while they work on the materials. This should shift your role from a dispenser of information (like a cigarette machine) to a manager of the environment, analyst, inspirer, diagnostician and clarifier.

Do some of these ideas sound like fun? Good. Write and let me know if any of these suggestions help or hinder your classroom lecture.

Dr. Rita B. Johnson
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Chapel Hill, North Carolina 27514

GUIDELINES FOR RATING LECTURE PRESENTATIONS I

Listed on the attached sheets are 25 statements intended to serve as guides for rating lecture presentations. After listening to a lecture, please respond to each statement by circling the number that most closely corresponds to your observation. Use the number code listed below:

4 = very adequately
3 = adequately
2 = somewhat adequately
1 = not adequately
0 = unable to judge

THE CONTENT PRESENTED WAS SUITED TO:

1) audience level (s) of sophistication;	4	3	2	1	0
2) audience interests	4	3	2	1	0

IN PRESENTING THE CONTENT, THE PRESENTER:

3) specified purposes in introductory statements;	4	3	2	1	0
4) organized material in logical sequence;	4	3	2	1	0
5) exhibited a thorough knowledge of the subject;	4	3	2	1	0
6) used examples to illustrate main ideas;	4	3	2	1	0
7) presented divergent viewpoint for contrast and comparison;	4	3	2	1	0
8) made clear his own viewpoint;	4	3	2	1	0
9) used clear, relevant illustrative materials (e.g. slides, tapes);	4	3	2	1	0
10) cited authority to support statements;	4	3	2	1	0

11)	stimulated the audience to think;	4	3	2	1	0
12)	summarized most important points periodically or at end;	4	3	2	1	0
13)	developed a conclusion related to purpose;					
14)	adhered to time limits;	4	3	2	1	0

DURING THE PRESENTATION, THE PRESENTER:

15)	displayed sincere interest in the subject;	4	3	2	1	0
16)	appeared at ease;	4	3	2	1	0
17)	was free of disturbing mannerisms;	4	3	2	1	0
18)	was sensitive to cues from the audience;	4	3	2	1	0
19)	encouraged audience to raise questions;	4	3	2	1	0
20)	avoided confusing technical jargon;	4	3	2	1	0
21)	could be heard by everyone;	4	3	2	1	0
22)	exhibited a pleasing quality and tone of voice;	4	3	2	1	0
23)	spoke neither too rapidly nor too slowly;	4	3	2	1	0
24)	used humor judiciously, appropriately;	4	3	2	1	0
25)	maintained audience interest from beginning to end.	4	3	2	1	0

INSTRUCTIONAL SKILLS WORKSHOP, 1969

RATING SCALE FOR DISCUSSION LEADER

Following is a list of contrasting pairs of behaviors that discussion leaders may engage in. Please circle one number between each pair to describe the person you are rating. For example, suppose you were rating the discussion leader on the pair of behaviors:

Relieved tension with a joke or laugh	7 6 5 4 3 2 1	Allowed tension to rise without interference

First, you would decide whether your discussion leader relieved or did not relieve tension. Second, you would decide how often did he relieve tension.

Suppose you felt that your discussion leader relieved tension often but not always, you would circle ⑥. If you felt that you could not decide for or against relieving tension, circle ④.

Be sure to make one and only one circle between each pair of behaviors.

Before you start rating do not forget to record the name of the person whom you rate and check first session if you are rating him for the first time or second session if you are rating him the second time.

1.	Relaxed, lively animated manner of leading discussion.	7 6 5 4 3 2 1	Monotone, somewhat stilted manner of leading discussion.
2.	Asked participants for their opinions and suggestions.	7 6 5 4 3 2 1	Inhibited participation by offering his opinions excessively.
3.	Asked open-ended questions that could be answered in several ways.	7 6 5 4 3 2 1	Asked "closed" questions to which there was only one factual answer.
4.	Expressed acceptance of participants' ideas.	7 6 5 4 3 2 1	Imposed himself by trying to push his own ideas.
5.	Encouraged discussion but kept it to the point.	7 6 5 4 3 2 1	Allowed discussion to wander from the subject.
6.	Helped the group to reach a consensus.	7 6 5 4 3 2 1	Refused to compromise a point.
7.	Encouraged participants to express different points of view.	7 6 5 4 3 2 1	Stifled the expression of differences in opinion.
8.	Pulled out of arguments concrete things to be learned.	7 6 5 4 3 2 1	Allowed arguments to terminate ambiguously without clarifying what has been learned.
9.	Shared with group members the responsibility for guiding the discussion.	7 6 5 4 3 2 1	Decided what shall be done and how it shall be done.
10.	Relieved tension with a joke or laugh.	7 6 5 4 3 2 1	Allowed tension to rise without interference.
11.	Tried to draw non-participants into the group effort.	7 6 5 4 3 2 1	Did not attempt to influence the amount of participation of individual members.
12.	Put suggestions made by people in the discussion group into operation.	7 6 5 4 3 2 1	Allowed suggestions to evaporate without making plans for action.
13.	Provided for review or summarized discussion	7 6 5 4 3 2 1	Failed to review or summarize.

Instructor's Notes

Teaching Techniques - Specific Methods

Group Discussion

As the article by Glatthorn (Learning in the Small Group) points out, there are many types of small groups not necessarily definable by size. Each has particular characteristics and is appropriate for certain learning tasks. Whether or not participants are given copies of the article is up to the discretion of the instructor. The abstract titled "Small Groups" is certainly appropriate to most participant groups.

In addition to Glatthorn's description each group can be viewed as a series of interactions. (These are discussed in "Assessing Behavioral Characteristics--and Interaction".) Interaction analysis, i.e., describing what is happening among the members of a group and within a group, is applicable to many group settings and may facilitate a study of their efficiency and effectiveness as a teaching-learning tool. A variety of observational forms are available for this purpose, as described in "Observation of the Learning Process". The form included here for use is intended primarily as an illustrative, easy-to-use form and does not purport to be supportable by intensive research.

Instructional Aids

The following materials are available:

Handout:	"Small Groups" "What Is Group Process" "Applying Behavioral Characteristics - Interaction Check List"
Trigger Film:	"Small Group" "Destroying Resident-Patient Relationship"
Article:	Glatthorn, Allan A. - Learning In The Small Group

You may need:

Video or audio tape equipment

Instructional Outline

Advanced Organizer: Distribute "Small Groups" abstract one week before the first session:

1) Show the "Small Group" trigger film and discuss ineffectiveness of leader and leader's style.

2) Arrange, if possible, to audio or video-tape the discussion above for later use.

- BREAK -

1) Show or listen to the tape of the first portion.

2) Collect impressions (good, bad, etc.,) of the session.

3) Introduce the "Applying Behavioral Characteristics" and (Interaction) check list and re-play the tapes using the check list.

4) Discuss differences among these techniques and their potential value in assessing the learning experience.

SMALL GROUPS

Objective:

The participants will be able to

1. name seven types of small groups and
2. describe the characteristics of each, including
    a. optimum size,
    b. leader role, and
    c. function (place) in the learning process;
3. identify any errors of leadership in any example of a small group and
4. explain why those particular behaviors are errors, including in that explanation the consequences for
    a. the student's learning and
    b. the group as a learning environment.

SMALL GROUPS

In any sequence of learning, a teacher must decide among at least three phases of instruction: large group, small group, and individual study. He must allocate among these phases information and/or skills on the basis of efficiency: what must be communicated to all students at the same time? What is best done with only a few students? What can the student be expected to pursue and learn on his own?

After this allocation--particularly in regard to the second question--the instructor must decide on the type of group necessary. The purpose he chooses to accomplish will not only determine the type of group but also the behavior of the leader in that group.

Most instructors approach small group instruction as though small group is synonymous with seminar, but there are several types of small groups each having a particular function in the learning process as the instructor may have decided in the above pre-instruction decisions he makes about the imparting of his information. The attached few pages constitute an abstraction, regarding these groups and their characteristics, from Allan Glatthorn's "Learning in the Small Group." Before viewing and discussing the trigger film on small groups, you should be very familiar with the groups Glatthorn presents and should have done one of the following activities:

1. Determine which--or if all--of the small groups are applicable to medical education, how they might be used, and how you as leader would function in each.

2. Construct a rating scale for evaluating the leadership in a discussion and apply it to at least one actual setting.

3. Identify the areas of resident instruction that would be allocable to the various groups Glatthorn discusses.

TYPE	LEADER	SIZE	PURPOSE	ESSENTIAL CONDITIONS
ain-torming	Student	12	It is problem-centered or solution centered.	1. The teacher should not criticize, evaluate nor react negatively to any idea. 2. See 6 conditions of Osborn's --Ideal number is 12 --Choose a subject that is simple, familiar, and talkable. --Criticism is ruled-out. --Free-wheeling is welcomed. --Quantity is wanted. --Combination and improvement are sought.
euristic	Teacher	?	Emphasis is on inquiry and discovery. To develop the skills of scientific inquiry -- to make students skillful askers of questions.	1. Students are first presented a concrete problem to serve as a focal point for their investigations. 2. Must establish a responsive environment. 3. Provide guidance in the process of inquiry. 4. Formulate and test hypotheses.
Socratic	Teacher	?	To provide an open and honest exchange of informed opinion.	1. The teacher becomes the socratic questioner and responder.

LEARNING IN THE SMALL GROUP

Allan A. Glatthorn

TYPE	LEADER	SIZE	PURPOSE	ESSENTIAL CONDITIONS
1. Task	Teacher	???	To involve students in meaningful work in which they can make a contribution.	1. Be sure task is clearly defined and understood by all. 2. Be certain that roles and individual assignments are sharply delineated. 3. Provide the necessary resources. 4. Check closely on the progress and hold them to realistic schedule.
2. Didactic	Teacher or Student	???	Present material to inform, to clarify, to review, to instruct.	1. Permit students to interact with questions and comments.
3. Tutorial	Teacher	7 to 8	Remedial Nature	1. The teacher uses the small group session to deal in turn with individual members.
4. Discursive	Student	7 to 8	This is a free and uninhibited discussion by students of a topic of prime importance	1. The teacher is an interested observer. 2. Useful to classes where the subject matter involves controversy or issues of significant interest to students. 3. Caution! Can be a waste of time if it becomes an exchange of prejudices or reinforces erroneous ideas.

Compiled by:

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WHAT IS GROUP PROCESS

All of us have spent much of our lives in various sorts of groups --- the family, classroom, athletic team, work group, etc. Rarely have we taken the time to stop and observe what was going on in a group beyond noting the topics discussed and the outcomes of this discussion. Our knowledge of why individual members behave in a certain manner or why meetings turn out the way they do is indeed sparse. Again, one of our main goals is to become better observers, participants and leaders of groups.

When we observe what a group is talking about, its various topics of discussion, or the task upon which the group is working, we are focusing on the *content*. When we observe how a group handles its communications, its relationships, while the group works we are focusing on group *process* or group dynamics. Questions referring to group content usually use the word "what" (for example, *what* did you talk about?). Questions highlighting group process often begin with the word "how" (for example, *how* did you make that decision?).

All collections of people that are organized enough to be called groups have potentially observable patterns of group process. And whether observed or not the nature of the group processes affects the degree of success that groups have in achieving their tasks or in maintaining their existence in a manner that yields satisfaction to its members. Awareness of group process better enables one to diagnose group problems early, to deal with them more effectively, and to provide a more likely possibility that the group will function successfully.

Group processes occur in all types of groups and the majority of the process dimensions presented below apply to groups that are formal or informal, those that are for play or work and to those that are temporary or permanent. Therefore, the process skills imparted here will make you more effective in the variety of groups in which you participate.

6-7

DIMENSIONS OF GROUP PROCESS

Below are some observation guidelines to help you analyse group process behavior:

A. PARTICIPATION

One indication of involvement is verbal participation. Look for differences in the amount of participation among members.

1. Who are the high participators?
2. Who are the low participators?
3. Are there shifts in participation? For example, highs become quiet; lows suddenly become talkative. Do you see any possible reason for this in the group's interaction?
4. Who talks to whom? Do you see any reason for this in the group's interactions? Who talks after whom, or who interrupts whom?
5. Whom do people look at when they talk?
    a. Single others, possibly potential supporters.
    b. The group.
    c. No one. (Why so?)
6. How are the silent people treated? How is their silence interpreted? Consent? Disagreement? Uninterested? Fear? Etc.
7. Who keeps the ball rolling? Why?

B. INFLUENCE

Influence and participation are not the same. Some people may speak very little, yet they capture the attention and have an impact on the whole group and the direction it takes. Others may say a lot but are generally not listened to by other members.

1. Which members are high in influence? When they talk others seem to listen.
2. Which members are low in influence? Others do not listen to or follow them. Is there any shifting in influence?
3. Do you see any rivalry in the group? Is there a struggle for leadership? What effect does it have on the other group members?

C. STYLES OF INFLUENCE

Influence can take many forms; it can enlist the support or cooperation of others or alienate them. How a person attempts to influence another may be the crucial factor in determining how open or closed the other will be toward being influenced.

1. One-up: Attempts to impose his will or values on others. The rationale he uses for this behavior is his greater age, experience, expertise, etc. He tries to push members to support his decisions. Evaluates or passes judgment on others. Blocks action when it is not moving in the direction he desires. Pushes "to get the group organized".

2. One-down: Deferential toward others; gives them power. Eagerly supports other members' decisions. Tries to avoid conflict or unpleasant feelings from being expressed by agreeing with others or by pouring oil on troubled water (with humor, diverting attention from conflict by topic shifting, denying differences that exist between members, etc.).

3. Democrat: Assumes *everyone* can make a contribution to the group's efforts. Tries to include each member in a group's discussion or decisions. Expresses his feelings and opinions openly and directly with a minimum of judging others. Open to hearing the impressions others have of him. When feelings run high and tensions mount, he deals with the conflict in a problem-solving manner.

4. Drop-out: Tries not to be influenced nor to influence others. Appears to lack involvement in the group. Has difficulty commiting himself to making or accepting group decisions. Participates mechanically and only in response to another's question. When he talks he negates what he asserts, speaks tangentially or generally it is difficult to know just what his opinions are.

D. DECISION MAKING PROCEDURES

Whether we are aware of it or not, groups are making decisions all the time, some of them consciously and in reference to the major tasks at hand, some of them without much awareness and in reference to group procedures or standards of operation. It is important to observe how decisions are made in a group in order to assess the appropriateness of the decision to the matter being decided on, in order to assess whether the consequences of given methods are really what the group members bargained for, and to see how the procedure affects implementing the decision.

6-9

Group decisions are notoriously hard to undo. When someone says, "Well, we decided to do it, didn't we?" any budding opposition is quickly immobilized. We can only undo the decision if we reconstruct it and understand how we made it and test whether the method was appropriate or not.

1. The Plop: Someone makes a contribution which does not receive any kind of response or recognition. For example, "I think we should begin the meeting now" . . . everyone continues their private conversations.

2. Self Authorized: Someone announces a decision and carries it out without checking with other group members. For example, he decides on the topic to be discussed and starts right in to talk about it.

3. Handclasp: One member supports another's suggestion and one or both of them carry it out. John Doe says, "I wonder if it would be helpful if we introduced ourselves?" "I think it would, my name is Pete Jones."

4. Majority Support: A majority pushes through a decision over other members' objections. Is a vote called for? Or are people polled individually for their position?

5. Consensus: An attempt to get all group members to participate in a decision. A genuine exploration to test for opposition and to determine whether opposition feels strongly enough not to be willing to implement a decision; not necessarily unanimity, but essential agreement by all.

Of course, some groups never reach a decision. They wander from one topic to another and may discuss endlessly.

E. MEMBERSHIP

A major concern for group members is the degree of acceptance or inclusion in the group. Different patterns of interaction may develop in the group which give clues to the degree and kind of membership.

1. Is there subgrouping? Sometimes two or three members may consistently agree and support each other or consistently disagree and oppose one another. To what degree do these subgroup events occupy the attention of the group as a way of gaining membership for its participants? Or some subgroups coalesce around rejecting the group, because of the group's membership or goals or procedures.

2. Do some individuals seem to be outside the group? They may be farther out of the group physically or have difficulty getting "air time". Do some members seem to be most "in"? They sit close in or lean forward or they have easy access to getting the floor.

F. FEELINGS

During any group discussion feelings are frequently generated by the interactions between members. These feelings, however, are seldom talked about. Observers may have to make guesses based on tone of voice, facial expressions, gestures and other non-verbal cues.

1. What signs of predominant feelings do you observe in the group's members: Anger, irritation, frustration, warmth, congeniality, affection, excitement, boredom, defensiveness, conflict, etc.?

2. Do you see attempts by group members to block the expression of feelings: Negative or positive ones? How is this done? Does anyone do this consistently?

G. NORMS

Standards or ground rules may develop in a group that have a strong impact on the behavior of its members. Norms usually express the beliefs or desires of group members as to what behaviors should or should not take place in the group. These norms may be clear to all members (explicit), or may operate below the level of awareness of the group members (implicit). Since norms may facilitate or hinder group progress, it is important that they be looked at (that implicit norms are made explicit) so that the group can decide if they wish to accept them.

1. Are certain content areas avoided in the group (for example, sex, religion, political views, talk about present feelings in the group, discussion of the leader's behavior, etc.)? Who seems to reinforce this avoidance? How do they do it?

2. Is conflict avoided when it occurs? Are group members overly nice or polite to each other? Are only positive feelings expressed? Do members agree with each other too readily? What happens when members disagree?

3. Are there norms about participation? (For example, "If I talk, you must talk." "We can only talk about our strengths and not our difficulties or vice versa." "We talk only about the person's ideas and not his personal style."

6-11

H. TASK FUNCTIONS

Behavior in a group can be viewed in terms of its function or purpose. Task functions refer to behaviors that are concerned with the group getting its job done. The varieties of behaviors that facilitate task achievement are described below:

1. Initiating: Proposing tasks or goals; defining a group problem; suggesting a procedure or ideas for solving a problem.

2. Seeking information or opinions: Requesting facts; seeking relevant information about group concern; asking for expressions of feeling; soliciting expressions of value; seeking suggestions and ideas.

3. Giving information or opinion: Offering facts; providing relevant information about group concern. Stating a belief about a matter before the group; giving suggestions and ideas.

4. Clarifying and Elaborating: Interpreting ideas or suggestions; clearing up of confusions; defining terms; indicating alternatives and issues before the group.

5. Summarizing: Pulling together related ideas; restating suggestions after the group has discussed them; offering a decision or conclusion for the group to accept or reject.

6. Consensus Testing: Asking to see if the group is nearing a decision; sending up a trial balloon to test a possible conclusion.

I. MAINTENANCE FUNCTIONS

These functions are important to the morale of the group. They maintain good and harmonious working relationships among the members and create an atmosphere which enables each member to contribute maximally. They insure smooth and effective team work within the group.

1. Gate Keeping: Controlling the channels of communication in two ways:
   a. Gate openers: Help keep communicating channels open; help others get into the discussion.
   b. Gate closers: Cuts off others or interrupts them.

2. *Encouraging:* Being friendly, warm and responsive to others; showing acceptance of others' contributions.

3. *Compromising:* When one's own idea is involved in a conflict, offering a compromise; admitting error; modifying in the interest of group cohesion or growth.

4. *Standard Setting and Testing:* Testing whether the group is satisfied with its procedures or suggesting procedures; pointing out explicit or implicit norms which have been set to make them available for testing.

ASSESSING THE BEHAVIOR CHARACTERISTICS

One of the first steps in the management of any particular problem clinically is the establishment of an accurate and complete diagnosis. This particular exercise is basically designed as a diagnostic tool to be used in evaluating teaching situations with which you are involved. Although initally it may seem to be a bit basic to analyze the details of individual interaction in the course of a learning situation, it has been found to be of value in assessing accurately what is going on in your program in order that you might continue to be satisfied with it or identify problems in order to appropriately correct them.

As a result of the program formulated in the following paragraphs you should be better able to:

1) use the interaction analysis system provided to identify the behaviors in varying teaching situations.
2) relate the behaviors manifested to the overall plan of the learning situation and determine whether the behavior hinders or assists the progress of the learning situation.
3) identify changes in behavioral patterns, if they occur as a result of the staff development.
4) assess their own behavioral characteristics manifested in various teaching situations.

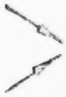
There seems to be little question that discussion involves individuals in interaction. The ways in which one individual interacts with another are well documented in interaction analysis. There are a prolifery of schemes which have been developed to chart these interactions and the ways in which one individual's actions can precipitate reaction in another.

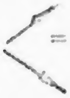
However, these plans are generally designed for the use of the trained observer rather than the active participant. Further, they generally require extensive background in group dynamics and/or protracted periods of training and practice.

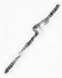
The method proposed here is uses of a form which allows the individual to be identified and the behaviors displayed by them to be itemized. Symbols are used to identify the behavior in question.

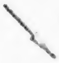
Assessing the Behavior Characteristics

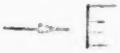
These are:

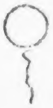
 = focus. Meaning those actions which tend to bring discussion to a point, or keep it "on the track."

 = open. Used to indicate those actions which broaden the discussion or help to consider additional issues.

 = elevates. Here the individual has attempted to raise the level of discussion.

 = simplify. Meaning those actions which bring the discussion to printed or simpler illustrations.

 = block. Those actions which tend to stop further discussion.

 = trial balloon. Actions which indicates that the individual is presenting the idea for consideration by the forms.

LEARNING IN THE SMALL GROUP

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INTRODUCTION

Many schools throughout the United States and Canada have succeeded in removing the organizational rigidities which, for generations, have made small group instruction impractical for all but the most well-to-do schools. Teachers, however, have been experiencing a great deal of difficulty in devising new methods which enable them to take full advantage of the small group's potential.

Too often the seminar teacher has continued to teach the new small group in much the same way he taught the conventional class of thirty. The seminar teacher tends either to dominate or abdicate. If he dominates the group, it becomes teacher centered, and spontaneity and originality is sacrificed. If he abdicates, chaos and superficiality result.

Dr. Glatthorn draws upon his own and his faculty's experiences with small group instruction to present this provocative article. The ideas expressed here were originally presented to a group of teachers and administrators attending the Abington Conference on Innovations in Education, held at Abington, Pennsylvania on May 1-3, 1966.

This speech is reproduced and distributed by I D E A as a service to teachers and administrators who wish to consider systematically ways for improving small group instruction in their schools.

Institute for Development of Educational Activities

Eugene R. Howard

B. Frank Brown

August, 1966

Let me begin by stating flatly that the small group is one of the most important educational innovations to be discussed at this conference. We could survive without the large group. We could manage without the complexities of the flexible schedule. But without the small group we would inevitably fail in our educational task. The reason is simple: it is only through the small group that we can multiply the opportunities for pupil-teacher interaction. And very significant kinds of learning take place only through such interaction.

This interaction becomes of prime importance for the student. He learns best when he is involved actively in the learning process, and the small group most effectively provides for such involvement. In the small group the student is seen as the individual learner -- he cannot be ignored, he cannot get lost as a passive listener. The shy student finds himself more at ease and gradually begins to speak up and opens up to the few who are with him. The talkative student who enjoys impressing a large class feels a bit different when five or six are sitting with him in the quiet of a seminar room, and he begins to listen. And the students are perceptive of the value of the small group. Most surveys of student opinion reveal overwhelming approval of the small group as a learning environment.

The teacher also benefits in very obvious ways. He finds himself functioning in a different kind of role — because the setting demands such a change. We have frequently heard the educational platitude that "changing a schedule won't change the teacher." Don't believe it. We have found that scheduling the teacher for a small group does change teacher behavior. Even the most dogmatic and didactically oriented teacher finds that he just can't lecture to five or six students. Our experience has been that once teachers have been successfully introduced to small group, they want more and more time for it.

These benefits for the students and the teacher apply in all subjects. It is a mistake to think that small groups are useful only in English and social studies: they have proved to be effective in mathematics, science, and foreign language. Incidentally, we have found small groups very effective as a way of working with problem students in guidance oriented seminars. Use this as a general maxim: if you can teach it in a group of 27, you can teach it better in a group of 10.

Given its basic importance, how do we schedule for the small group? There are those who say it should not be scheduled. Let the teacher divide his class group when he sees the need for it, the argument goes; he will thus achieve greater flexibility. Unfortunately, the average teacher does not operate this way. Given the option, most teachers would be so obsessed with their need to dominate instruction that they would only very reluctantly and only very occasionally divide their classes into small group.

We begin then by arguing that the small group is such a vital component of learning that it must be a scheduled activity — and scheduled as often as possible.

Given this basic premise let's turn our attention to other specific matters dealing with the small group.

First, what physical arrangements would make for the best small-group performance? We should not make the mistake of assuming that the small group can function effectively in any kind of environment. Adequate ventilation, proper seating, good acoustics, and attractive environment all produce better discussion. While there has been much well deserved kidding about the teacher who always wants to "put our chairs in a circle and begin to discuss," such scorn should not make us forget that for most small group purposes, the arrangement whereby people who are speaking to each other can also face each other is the best arrangement. Very careful research has documented the fact that such an arrangement produces the most productive exchange of ideas. One interesting sidelight: even in a circular arrangement, members tend to address more communications to the person opposite them, not to the person on their right or on their left.

How small should the small group be? Possibly no other aspect of small-group learning has been so diligently researched. The research suggests that, first of all, there is no single ideal size for all groups. The best size depends on the nature of the task and the skills available in the members of the group. It has been suggested by Thelen that for any task-oriented group the ideal size is the smallest number that represents all the required skills necessary for the accomplishment of the task. In a group that is essentially discussion oriented the evidence seems quite clear that five or six represents the optimum number. With a group fewer than five, the individual members feel threatened; they know clearly they are on the spot. Such a threatening situation tends to inhibit free response.

On the other hand, in a group larger than five the amount of participation by the individual members can fall off sharply. The bigger the group, the greater the gap there is between the most frequent contributor and the rest of the group. In a typical class group of thirty, it usually happens that no more than one-third participate actively in a forty-five minute period. Even in the group of twelve or fifteen you will probably notice that only the most forceful individuals are expressing their ideas. My hunch — and it is only a hunch — is that the small group starts to look like a class when it gets to be about 14 or 15.

Does this mean that if teachers have been scheduled with a group of fifteen they must conduct the discussion with such a number? Not necessarily. They should experiment with group size, find to what extent all can be actively involved and, if necessary, subdivide the seminar of fifteen into two groups of seven or eight. One note about the composition of a small group. One study has indicated, perhaps surprisingly, that heterogeneous groups are superior to homogeneous groups in finding inventive solutions.

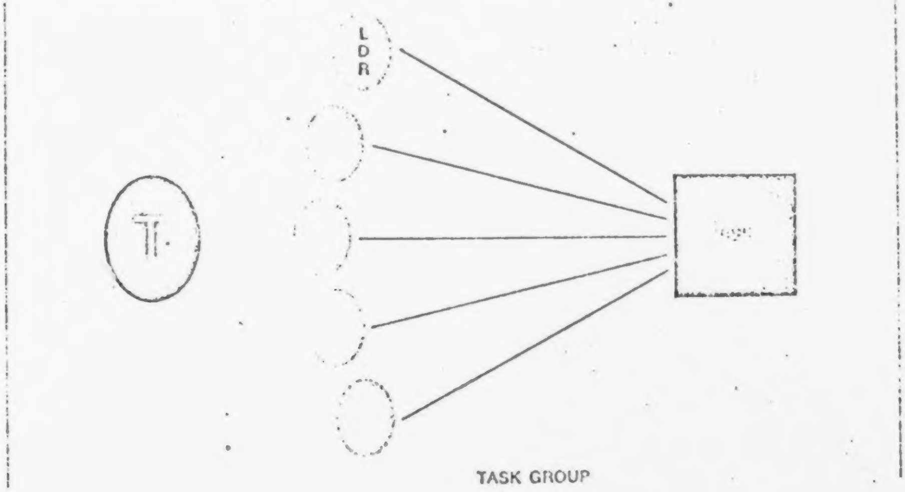
So much for the matters of physical arrangement, size, and composition. Let us next turn our attention to the nature of leadership in the small group. Here again there is much confused thinking. There are those who contend that only the teacher can direct the small group — and only the teacher who also teaches these same students in class. Others insist so strongly on the importance of a student-centered situation that they assert that only the student can lead. Both positions ignore the very simple point that leadership is a function of task. Later we shall attempt to point out more specifically how this is so. Even when student leadership is used, however, merely appointing the student leader does not end the teacher's responsibility. He must work with the leader, prepare him, help him see the kinds of questions that must be asked, help him evaluate the discussion. It is usually wise to rotate student leadership. Also, it is considered desirable to use the student observer in the group. The observer can serve as a summarizer, evaluate progress and, most importantly, can keep track of participation. Most teachers are blind to the extent to which students do not participate in most discussions.

We have heard much talk and have read much about the importance of democratic leadership in a group. A few points perhaps need to be made here. Democratic leadership does not mean laissez faire leadership. It means, first, the active participation by the teacher as a guide who has respect for student opinions. It means the teacher must listen to student ideas, must give students a chance to express their feelings, and should within reason permit student preferences to determine the nature of the group task and the methods for group attack. In the long run, democratic leadership may be preferred by the group; initially, however, students resent it and prefer the most directive kind of approach. One study showed that in a group with an active leader as opposed to a group with only an observer, the leader-group more frequently arrived at the correct answer, since the leader was able to secure a hearing for the minority viewpoint.

Just as leadership will vary with the nature of the group task, so will the optimum length of time for any single meeting of the small group. As we discuss below the special types of small groups, it will probably be possible for you to make some inferences about the time needed. I would, however, like to make some general observations based on our experiences with two years of small group work. First, we have found that our single module of twenty-three minutes can be effective for some types of discussion. While some teachers complain that it seems a bit too short, I personally have found that it is desirable not to reach closure with the small group — but to have students leave with the issues still unresolved, with questions turning over in their minds. Also, some teachers report that our double module of forty-six minutes is just a bit too long for the low ability student to keep a good discussion going. But these judgments are probably best arrived at through your own experience, not by listening to ours. As a very general rule, let me suggest that a thirty-minute period might work well for most small group activities.

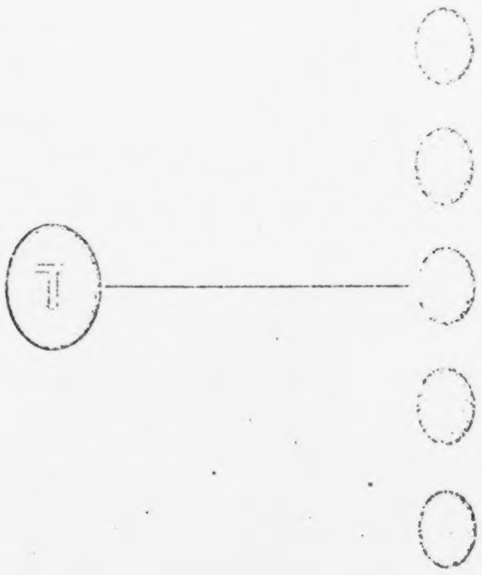
What of these small group tasks to which we have alluded? What can the small group do in the educational setting? Here again there has been a too narrow view of the small group. Some teachers think that the small group must be tied in closely with the content of the curriculum, and they get much upset if each of their small groups does not follow a given large-group presentation. Such teachers are too much concerned with covering the curriculum where they should be concerned with *uncovering* and *discovering* with students a world of exciting knowledge. And it is in the small group that uncovering and discovering best take place. Actually, of course, the small group has numerous roles and functions which can be identified simply by asking, "What can I do with a group of ten that I cannot do just as effectively with a larger group?" I would like to discuss with you several different types of instructional groups.

The first might be called the task group. In our "life adjustment" days we called it committee work. But it is not to be sneered at. The small task group can be an effective way of involving students in many types of meaningful work in which each member can make a significant contribution. The rules for the successful task group are known to all of us who have worked unproductively on committees: be sure the task is clearly defined and understood by all; be certain that roles and individual assignments are sharply delineated; provide the necessary resources or indicate where they might be obtained; check closely on the progress of the group and hold them to a realistic schedule; provide for some type of feedback to the larger group through oral, written, and/or audio-visual reports. This diagram perhaps illustrates the nature of the task group:



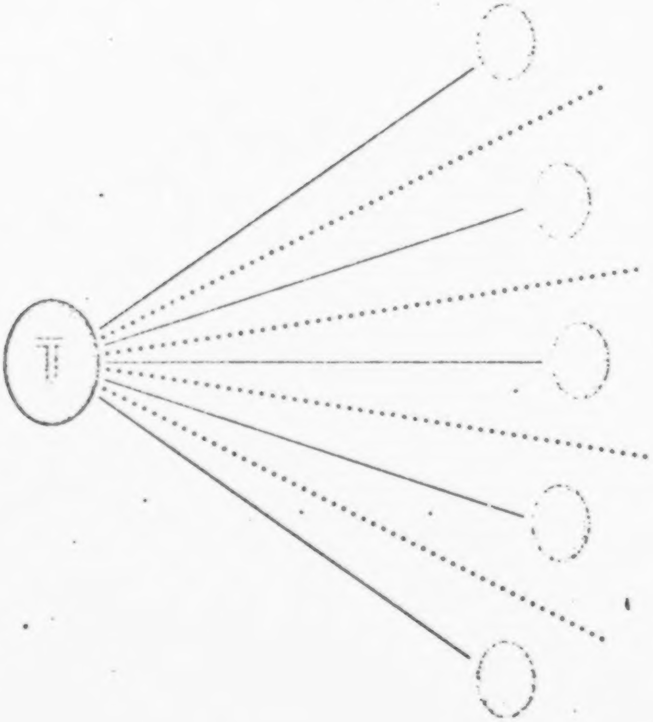
TASK GROUP

The second type of small group I would designate as the didactic group. In the didactic small group the teacher -- or a student leader — presents material with the purpose of informing. At times we hear educational dogmatists state that the teacher should never teach in a small group. I always suspect such dogmatic generalizations. There is justification, I think, for the teacher occasionally to use the small group to review, to clarify, to instruct, permitting the students to interact with questions and comments. I think there are certain things a teacher can teach in a small group — and I mean teach — that can not be taught as well in a class of twenty-seven. I would diagram the didactic group like this:



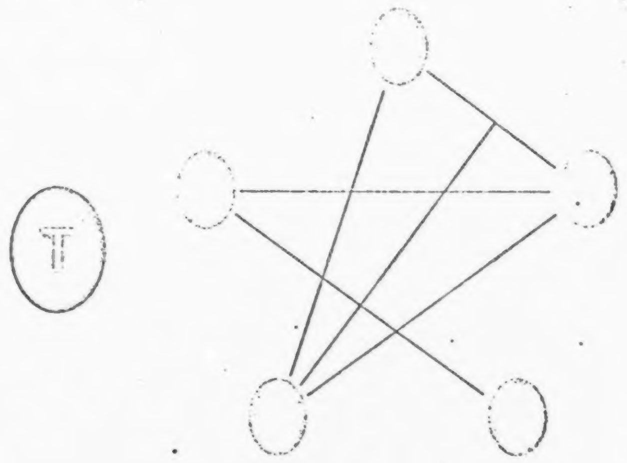
DIDACTIC GROUP

The third type might best be called the tutorial. Here the emphasis is on individual instruction, usually of a remedial nature, although it may well be individual instruction, motivation, or evaluation for an independent study project of an advanced nature. The teacher – or again an able student – merely uses the small group session to deal in turn with the individual members. A good teacher can probably give effective individual attention to seven or eight students in a half-hour period and accomplish much real benefit for the learner. The small group tutorial might look like this:



TUTORIAL GROUP

The fourth type is one which we term the discursive group. This is the free and uninhibited discussion by students of a topic of prime importance to them. It would be a mistake for teachers either to exclude completely the discursive discussion or to indulge in it too much. It can make a very valid contribution to any class where the subject matter involves controversy or issues of significant interest to students. No preparation is, of course, needed by the teacher except to find the topic of sufficient interest for the class. And the teacher's role is merely one of an interested observer. All he needs to do is stay out of the way. He should listen attentively to student opinion, notice carefully who is taking part, watch closely for student reaction. Teachers, of course, need to be admonished about overusing the discursive approach. It can be a great waste of time and often is productive of nothing except the exchange of prejudices, serving merely to reinforce erroneous ideas. Teachers who boast again and again, "We have the greatest discussions in my class," often are deluding themselves if these so called "great discussions" are only bull-sessions. The discursive group might look like this:



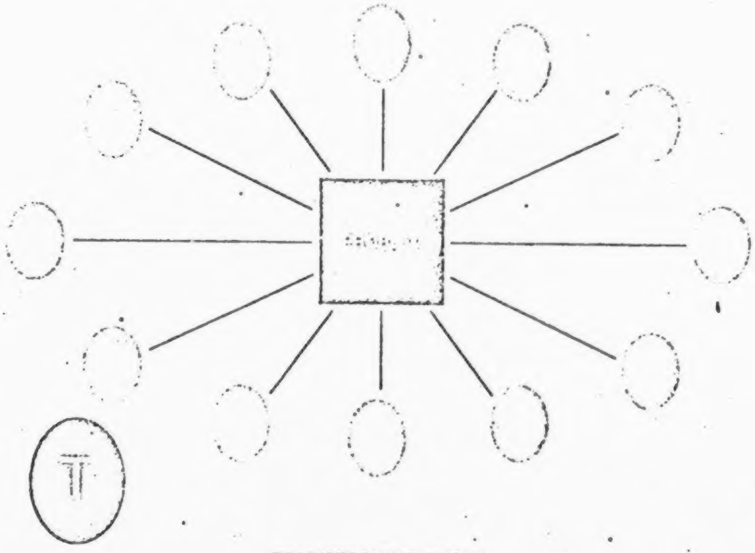
DISCURSIVE GROUP

The fifth kind of small group is perhaps best characterized by the term "brain storming" coined by Alex Osborn, the originator of the technique. "Brain storming" like the bull-session, is free and uninhibited. It tends, however, to be problem centered, or solution centered. The teacher's role in the "brain storming" discussion is merely to motivate, to get the ball rolling, and then to stay out. The teacher should not criticize, evaluate, or react negatively to any idea advanced in the "brain storming" session.

Here are a few suggestions culled from Osborn's books: 1. The ideal number for a brainstorming group is about twelve. 2. Choose a subject that is simple, familiar, and talkable. When a problem calls for use of paper and pencil, it usually fails to produce a good session. 3. Criticism is ruled out; adverse judgments of ideas must be withheld until later. 4. "Free-wheeling" is welcomed; the wilder the idea, the better. 5. Quantity is wanted. 6. Combination and improvement are sought. In addition to contributing ideas of their own, participants should suggest how ideas of others can be turned into better ideas, or how two or more ideas can be joined into still another idea.

Those who are interested in more information about "brain storming" are referred, of course, to Osborn's own works.

The diagram below shows the problem -- centered concern of the brain-storming group.

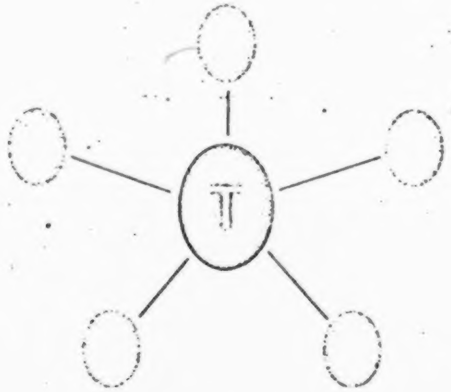


BRAINSTORMING GROUP

The sixth type of small group might best be termed heuristic. Here the emphasis is on inquiry and discovery, and the teacher becomes what Suchman calls a responsive environment. Briefly, the emphasis on the Suchman inquiry training is to develop the skills of scientific inquiry—to make students skillful askers of questions. As you know, with Suchman's approach the students are first presented with a concrete problem to serve as a focal point for their investigations: in his particular use of inquiry the concrete problem is a film of a physical event. The second condition he establishes is a responsive environment: we make it possible for the children to gather whatever additional data they need by asking specific questions which are restricted to the "yes-or-no" format. Third, we provide guidance in the process of inquiry. He sees three stages emerging here: the first is episode analysis asking questions that make sure you have an accurate picture of what it is you are trying to explain. Stage two is called the determination of relevance, asking yes-no questions to determine which facts are relevant to the explanation and which are not, which conditions are necessary to the outcome of the filmed demonstration.

The third stage he calls the induction of relational constructs. This is where hypotheses are formulated and tested. The children construct an hypothesis based on relational constructs, test their hypothesis and find it tenable or untenable. The Suchman approach provides finally for critiques of past inquiries, using tape recordings of previous sessions.

While some of us have reservations about a possible over-emphasis on process in the Suchman inquiry training, all of us can learn much from the general approach of making students the question-askers and teaching them the skill of scientific question asking. A diagram of the heuristic small group might look like this:



HEURISTIC GROUP

The final type of small group we would call maieutic or Socratic. Here the teacher becomes the Socratic questioner and responder. He begins by posing a problem for the group: "Is *Death of a Salesman* a great tragedy?" Note that the problem posed should be one in which the answer can best be determined through the open and honest exchange of informed opinion--through the dialog of searching minds. If the problem can be answered by consulting a reference book, it is not a suitable problem for the maieutic discussion. Having posed the problem and defined it clearly, the teacher does not retire to the rear; instead, he continues throughout the discussion to have a very active role and the good maieutic discussion can be led only by a highly trained teacher. It is the most taxing and demanding of all his tasks.

The maieutic discussion probably begins with the teacher challenging, disturbing, demanding definitions, driving the discussants back into a corner to examine their prejudices, to defend their position, to analyze their biases and preconceived notions. At times during the preliminary stage the teacher will play the devil's advocate, seeming to assume positions he really doesn't hold. The teacher's responses during this stage would probably sound negative to those committed to the dogma of interaction analysis—"Prove it. Define it. Why do you think that? Where is your evidence? Had you considered this possibility? Do you really mean that? What do you mean?" The first stage probably ends with the students confused, upset, and dismayed to see their prejudices demolished. But this is only a first stage. Unfortunately, some teachers—usually very young ones—leave them there. The first stage is destructive, and destruction should be only a necessary preliminary to reconstruction, the second stage.

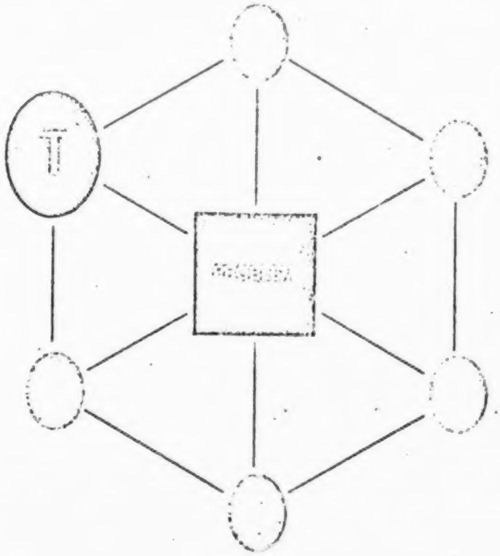
At the conclusion of this first stage, it might be wise for the teacher to do a bit of constructive summarizing. "Now look, we have made some false starts but we also have come to some tentative agreements. We have defined tragedy as the fall of a great man through some external or internal force, a fall which leads to some greater reconstruction. Now let's take that definition and apply it to Miller's play."

During the second stage the teacher must do a lot of good hard listening. (And did you ever notice what poor listeners we really are? We really don't hear what students are saying—with their words and their non-verbal communication.) We must listen then very carefully to every student answer and we make a split-second judgment about how to respond to it. Is the comment totally irrelevant and should I very gently get him back to the subject? Is his comment totally unproductive and should I just give him a bit of encouragement but try subtly to get another answer from someone else? Does this answer contain a piece of the truth which can be related to what has been said before by someone else? Does this response contain some glaring fallacy which should be challenged by some other student? Does this response contain a really fresh insight which should become the focus for a new line of thinking?

It is evident that during this stage the teacher becomes more than a challenger and more than a listener. He becomes a leader and a participant in the search for truth. Suddenly he finds himself caught up in an exciting dialog of searching minds. He probes, directs, stimulates, entices, responds, channels, synthesizes. And he learns. Any teacher who doesn't learn from every discussion he conducts just hasn't listened.

I might make this other point about the small group maieutic discussion. Be sure that the students develop the art and skill of listening and responding to each other. With the unskilled teacher the small group discussion too readily becomes teacher centered, with all questions and answers aimed unilaterally at the teacher.

Note, as this diagram shows, the role of the teacher is the unique one of participant-leader, with the students responding to each other and to him. As I indicated this participant-leader role in the *maieutic* discussion is the most challenging kind of teaching. And anyone who says airily, "My students can lead a discussion just as well as I" is talking through his modular hat.



MAIEUTIC GROUP

With these major types established, let us conclude with some final general matters.

First, can small group be evaluated? Obviously it can be and it must be. Some suggestions follow: First, there is need for group evaluation which says in effect, "How did we do today?" "Did we reach our goal?" How many of us participated?" As mentioned before, an observer is of much help here. Second, there is obviously a need for teacher evaluation. But such evaluation should not be purely quantitative. The teacher is unwise who says in effect, "The one who talked the most gets the best grade." The teacher should learn to distinguish between meaningless verbalism and thoughtful analysis; he should learn to treasure the student who makes a few insightful comments and to chasten the garrulous dominator of discussion who really contributes nothing of substance. Finally, there is the need for individual student evaluation. In some cases it might be wise for students to keep a log of the discussions in which they participate.

Since in the small-group discussion teacher-student relationships are of key importance, it might be helpful at this stage to turn our attention to this crucial nature of teacher-student relationship. Again, there is no easy answer. The teacher must learn to play it by ear and must respond to individuals. While it is difficult to generalize, perhaps we can be of help by making some suggestions about handling certain typical small-group types. First, what do you do about the hand-waver; the student who constantly thrusts his hand in your face and almost demands your attention? To begin with, you cannot ignore him completely. This would only tend to make him resentful or else intensify his demands. Neither should you take the easy way out and call on him any time he has his hand waving. The best answer is to make him see that you value his participation, but you don't want others to be excluded. Second, what about the student who is the constant butt of class ridicule? To begin with, he needs your support. The class needs to learn that each of us has a right to be heard and that no student or teacher deserves ridicule. No matter how outrageous his questions or answers may be, find something in them to support. Make him see that your class is an open forum for the exchange of ideas, not merely a place where the sycophant can perform.

What about the shy type, the student who rarely answers just because he lacks security? Sometimes it helps, if the problem is especially acute, to talk to the student, to encourage him to participate and to prepare him for the discussion to come. You might say, for example, "John, tomorrow I'd like to discuss the garden symbolism in 'Rappacini's Daughter.' Will you give this your careful attention tonight and be prepared to make some comments tomorrow." Also, it is helpful with this kind of student to ignore the oft-repeated warning about not mentioning a student's name first when asking a question; give the shy student some warning that he has to answer. Don't confront him abruptly with a difficult question. Say something to this effect, "John, I'd like you to give thought to this. The garden in 'Rappacini's

Daughter' has a symbolic significance. What do you think the garden really stands for?" Then pause. Don't be afraid of silence, but give him a chance to think by amplifying the question. "Of course, it may not have any symbolic significance at all, but most who have read the story generally are convinced that it does have. Do you have any notion, John, as to what the symbolism may be?"

So much for the shy type. Now let us say something about the diversionist, the student who purposely or unintentionally sidetracks discussion. He must be dealt with firmly. You can answer his question of a diversionary nature briefly and then say, "That's not really the substance of our discussion. Let's get back to the point." At times, of course, the sidetrack can be illuminating and provocative, but for the most part the problem-centered discussion should stay on the track.

Finally, what of the shocker--usually a gifted student who tries to shock you and his classmates by giving some outrageous answer. The obvious answer is not to be shocked, since that is the effect he wants. Deal with his ridiculous answer calmly and quietly but deal with it effectively. Do not permit nonsense (from any source) to go unchallenged in the classroom.

It is evident that the teacher needs much training to function effectively in all small groups, regardless of the type. What type of training is most effective? He should be knowledgeable about the findings of the specialists in group dynamics and sociometry; Shepherd's *Small Groups* is a good source here. He should explore the use of one of the more promising types of methods for analyzing student-teacher interaction in the small group. The work of Flanders and Amidon looks most helpful here; and Olmsted's *The Small Group* provides a good summary of other interaction analyses methods. But most of all the teacher needs some in-service training in the school on the spot. We at North Campus have effectively devoted entire faculty meetings to the matter of the small group and have used small group demonstration lessons with good effect. I think also the teacher needs much feed-back through observer reports, pupil rating sheets, and audio and video tape. The last, I think, has much promise for improving the teacher's performance in the small group.

But we must also help the student grow in his skills with the small group, and these skills can be presented in a large-group lecture. A few suggestions for teachers might be appropriate here: 1. Stress the importance of the small group sessions. Some compulsive students will feel that they are a waste of time and demand that you get on with the "business" of teaching; other students will be tempted to waste the time with frivolous talk. 2. Use the procedures suggested in selecting and training student leaders and observers; have them use an observer evaluation check list. 3. Help the students develop goals and objectives for each discussion: what should we try to accomplish in this session? 4. Stress the importance of listening skills in the small group. Critical listening is especially important here: they need to develop the ability to listen objectively to contrary points of view, to weigh arguments critically, to detect fallacies in thinking, to recognize prejudices. 5. Help them develop the skills of responding—knowing how to differ without animus and rancor, how to take a point made by another and use it as grist for one's own intellectual mill, how to advance discussion, how to get discussion back on the track. 6. Help students evaluate their discussions. From time to time tape a discussion and play it back for critical evaluation. Take a few minutes at the conclusion of each discussion to ask, "How did we do?"

I hope it is evident from this discussion that the small group serves so many vital functions that all schools regardless of their commitment to modules or to classes should find more and more time for small group activities.

Teaching Techniques - Specific Methods

One-to-One Instruction

Much of what occurs in residency training, or indeed in most medical training, is one-to-one instruction of primarily involving question and answer sessions. It is obvious, then, that if this form of instruction is to be improved one needs to have a way of looking at the kinds of questions which are asked, the quality and value. This lesson deals with two separate approaches to individual questioning and individual question appraisal. Choice depends upon the situation and the comfort of those using the devices presented.

Instructional Aids

The following materials are available:

Trigger Film:	"One-to-One Instruction"
	"The Oral Examination"
Handout:	"Inquiry Intensity"
	"Revised Taxonomy of Intellectual Processes"
	"Categorizing Questions"

You may need:

Instructional Outline

Trigger Film: "One-to-One Instruction"

Advanced Organizer: Distribution of the materials "Inquiry, Intensity" - "Revised Taxonomy of Intellectual Processes"

1) Trigger film the "Oral Exam".
   a) Application of the matrix to the film.
   b) Discussion of the variety of responses on the matrix.
2) Discussion of the film.

- BREAK -

3. Discussion of general question types. Concentrate on what methods of questioning each participant is most comfortable with.

4. Talk about type of question - intensity and intellectual process. Role-play each type where possible.

5. Apply matrix to role-play sessions. Discuss results.

Inquiry Intensity

A major mitigating factor involved in the information interchange seems to be the intensity with which an inquiry is asked. Even high-authority figures may make inquiries in a manner and at a rate which place minimum stress on the respondent. On the other hand, peers or subordinates may engage in an argumentative encounter in which the questioning is very intense, resulting in a stressful situation for all individuals involved. As a result, there seems to be a range of intensity which may be inferred from: a) the rate at which inquiries are presented; b) the tone of voice in which they are asked; and c) the stress placed on the various elements within the inquiry.

It seems reasonable, therefore, that these factors be considered as inferential evidence of the stress level on the respondent; this range may be classified as follows:

1. Interrogation: Those inquiries made very intently with strong feeling, often in rapid-fire sequence. Even the rote memory question may be involved, i.e., "What is his problem, doctor?", which may carry with it the implied threat to justify your position or else.

2. Investigation: Those inquiries which are somewhat less stressful than those above, but which likewise imply the respondent is under investigation and is expected to justify his position or state his opinion with rationale given.

3. Inquiry: The rather mild inquiry which is asked simply for the sake of gathering information and possibly generating other comment in addition to the answer to the question.

There are undoubtedly other eponyms for this range of intensity which might be used satisfactorily. It is also obvious that there gradations within each of these three sections. However arbitrarily the gradations to be used are, they should fall into the following subdivisions: 1 (low) through 3 (high).

Recording Form

The following diagram places these two factors in a grid. If we can consider that the vertical axis, that is the intensity of inquiry, is really a continuum upon which we have placed some arbitrary dividing points, we can then scale the educational encounter in terms of the intensity with which the types of questions are asked. The actual record simply consists of recording, in the appropriate square, the gradation of the inquiries in a given session.

		Recall	Interpretation	Problem Solving
Interrogate	3 1			
Investigate	3 1			
Inquiry	3 1			

CATAGORIZING QUESTIONS

Exhibit # 1

Most learning activities in medicine involve interchange of information, ideas, discussions etc. While such an interchange may or may not be titled a learning experience, it's central theme is the exchange of information which is inherently educational in nature. It is this process - the giving and receiving of information - which seems to elude accurate description. The ability to accurately describe such encounters is helpful in evaluating and improving attending staff performance.

THE PURPOSE

As a result of the program formulated in the following paragraphs the attending staff should be better able to:

1) Recognize and categorize types of questions.
2) Evaluate the responses elicited by their questions.
3) Recognize the appropriateness of the questions they ask residents.
4) Categorize the types of activities developed by residents and attendings.
5) Provide appropriate feedbacks to residents regarding their activities.
6) Assess their own ability as teachers and provide for feedback.

Research indicates that the interchange between attending staff and resident involves two key elements:

1) The types of inquiry.
2) The way in which the inquiry is made.

THE TYPES OF INQUIRY

One catagorization of inquiry is that of Bloom.(See "Revised Taxonomy of Intellectual Processes".) A somewhat different approach is suggested by other authorities. Gallagher, for example, has suggested that inquiries can be categorized by the thought processes required to formulate an answer in response to them. These are:

1. Rote memory: Those inquiries which require only remembering or recalling information. "Tell me what you know." Orthopaedic inquiries of this type might well be:

   "What medication have you ordered?"

   "What diagnostic test is appropriate for . . .?"

   "When was Mr. X admitted; what other complaints did he have?"

2. Convergent: Those inquiries which require the "fitting together" of information in order to respond. Examples of this type of inquiry would be:

   "Why does he walk that way?"

   "How will this procedure change this patients hand function?"

   "Why didn't this kind of traction work?"

3. Divergent: Those inquiries which require the respondent to think of other possible solutions and procedures than those already discussed, or other ways in which the problem being discussed can be solved. Examples:

   "What else might you do?"

   "What other medication might be helpful?"

   "Are there other procedures which might be helpful for this problem?"

   "Knowing what you now know, what else could you have done?"

4. Evaluative: Those inquiries which require the respondent to make judgments about the relative values of a number of possible choices and the selection of what he considers to be the best of these several alternatives. Examples:

"Would a Symes Amputation be better in this case?"

"Would a Magnuson Stack procedure work as well?"

As is apparent, these categories are hierarchical in nature. That is, it is impossible to answer a convergent inquiry without remembering (rote memory) the elements to be fitted together. Also, one cannot evaluate without employing rote memory, convergent, and divergent thinking.

INQUIRY INTENSITY

The other major factor involved in the information interchange seems to be the intensity with which an inquiry is posed. It appears possible to infer the degree of intensity from: a) the rate at which inquiries are presented; b) the tone of voice in which they are asked; and c) the stress placed on the various elements within the inquiry. Even those perceived by the residents as high-authority figures may make inquiries in a manner and at a rate which place minimum stress on the respondent. On the other hand, peers or subordinates may engage in an argumentative encounter in which the questioning is very intense, resulting in a stressful situation for all individuals involved.

It seems reasonable, therefore, that a range of intensity with which the inquiries are made may be considered to be inferential evidence as to the amount of stress placed upon the individual who is required to respond to them. This range may be classified as follows:

1. Inquiry: The rather mild inquiry which is asked simply for the sake of gathering information and possibly generating other comment in addition to the answer to the question.

2. Investigation: Those inquiries which are somewhat less stressful than those above, but which likewise imply the respondent is under investigation and is expected to justify his position or state his opinion with rationale given.

3. Interrogation: Those inquiries made very intently with strong feeling, often in rapid-fire sequence. Even the rote memory question may be involved, i.e. "What is his problem, doctor?", which may carry with it the implied threat to justify your position or else.

There are undoubtedly other eponyms for this range of intensity which might be used satisfactorily. It is also obvious that there are gradations within each of these three sections. Arbitrarily each of these three has been divided into three subdivisions: (1) low, (2) average, and (3) high.

RECORDING FORM

The diagram below places these two factors in a grid. If we can consider that the vertical axis, i.e. the intensity of inquiry, is really a continuum upon which we have placed some arbitrary dividing points, we can then scale the educational encounter in terms of the intensity with which the types of questions are asked. In regular usage, these diagrams would be placed three to a sheet, with instructions that general information indicating the setting of the encounter, and the participants involved. In addition, one grid would be used for characterizing the predominant activity type during the encounter, the second diagram for the next most frequent, and the third diagram, if necessary, to identify an encounter which did occur but was not the most predominant or second most notable in that particular encounter.

		Rote	Convergent	Divergent	Evaluation
Interrogate	3				
	1				
Investigate	3				
	1				
Inquiry	3				
	1				

Examples of the way in which this system could be used follow:

A Revised Taxonomy of Intellectual Processes

COGNITIVE DOMAIN

Questions can be categorized by the thought process required to formulate an answer in response to them. The level is dependent on the respondee's sophistication; what is recall for the clinician maybe problem solving for the second year medical student.

It should be obvious that the system is hierarchy since all lower levels are contained in upper level classifications i.e., recall and simple interpretation are required for problem solving and evaluation.

LEVEL I: RECALL

Questions testing primarily the Recognition or Recall of isolated informatory; such questions require predominately an effort of memory. They may include: recognition of typical morphologic lesions, or recall of specific facts, generalizations, concepts, principles, processes, procedures, or theories. Whether or not it is specifically mentioned, such questions imply "what is X?"

Recall inquiries in oral examinations are frequently calls to "tell me what you know." Sample questions might include:

What medications have you ordered?
What diagnostic test is appropriate for ...?
When Mr. X was admitted what other complaints did he have?

LEVEL II: SIMPLE INTERPRETATION

Questions testing primarily SIMPLE INTERPRETATION OF LIMITED DATA. Such questions require more than simple recall, but less than problem solving. They include questions that require translations from one form of specific verbal tabular, morphologic or graphic data which are new to the student, interpretation or extrapolation om such data and recognition of the constituent elements and ionships among such data. Questions at this level will ordinarily "how do you interpret X? What does it imply? Knowing X tr what would you expect to be true of Y?"

Why does he walk that way?
Why does a femoral shunt sometimes work?
Why doesn't this kind of traction work?
What do the results of this test tell you about his problem?

LEVEL III: PROBLEM SOLVING AND EVALUATION

Questions testing primarily the APPLICATION of knowledge to the solution of a specific problem and the FITTING TOGETHER of a variety of elements into a meaningful whole. Items of this type maybe based on clinical reports which require the student to develop a differential diagnosis or a therapeutic regiment. Alternatively, such questions maybe based on a case report of a type prepared for the typical clinical-pathological conference or research report or the presentation of a theory together with evidence, and will require the student to evaluate the total presentation.

Examination items which fit here would include:

Would you be willing to risk X in this situation?
Would a Symes amputation be better in this case?

FEEDBACK

Instructor's Notes

Essential to modification of behavior is an awareness of the impact of that behavior on other human beings. This unit deals with the effective utilization of feedback to facilitate the teaching/learning process.

Instructional Aids

The following materials are available:

Trigger Film: "Presenting Patients"

"Insensitivity to Patients"

Handout: "Feedback"

"Feedback Check list"

You may need:

16mm Sound Projector

Instructional Outline

1. Show trigger film "Presenting Patients".
2. Discuss actions of attending and students.
3. Develop list of ineffective actions and remedies for each of them.

- BREAK -

4. Show trigger film "Insensitivity to Patients".
5. Divide participants into pairs and
   (a) Have one individual role play the senior resident shown in the film; the other an attending who comes upon the scene. Have the attending provide feedback about the actions of the resident.

(b) Have both complete the feedback check list.

(c) Ask the individual playing the role of the resident to present his feedback to the individual playing the role of the attending.

(d) Come together in a group to discuss differences in values checked by the individuals in the pairs.

Teaching Techniques - Specific Methods

FEEDBACK

An integral part of any learning situation is the feedback incorporated within it. This includes not only feedback to the learner concerning his progress, but also feedback to the instructor concerning how well his objectives are being attained. This aspect of the learning situation is considered important enough that a separate and distinct unit was formulated in order to develop facility in the use of feedback techniques and to focus attention on feedback as a part of the educational process. Essential to optimal performance by an instructor during a learning situation is his knowledge of the appropriate use of feedback. Feedback is a way of giving and receiving help. It is a corrective mechanism for the individual who wants to learn how well his behavior matches his intentions whether that individual be the instructor or the learner. It is an integral part of all educational experiences.

THE PURPOSE

As a result of the program formulated in the following paragraphs, the attending staff should be better able to:

1) Identify the salient characteristics of useful feedback.
2) Evaluate examples of feedback interviews using the appended rating scale.
3) Identify their own feedback techniques.
4) Identify students feedback techniques.
5) Improve if necessary their use of feedback in learning situations.

It is first important to realize the salient characteristics of useful feedback. Without going into an intensive review of the literature, we will simply list those aspects of feedback which are considered criteria for usefulness.

1) It is descriptive rather than evaluative. Therefore, by describing the reaction it leaves the individual free to use the feedback or not to use it or to use it as he sees fit. By avoiding evaluative language it reduces the need for the individual to react defensively.

2) It is specific rather than general. Therefore, it allows the individual to respond in a specific fashion to a specific type of feedback rather than confusing him with general statements that does not allow him to focus in on the problem at hand.

3) It takes into account the needs of both the receiver and the giver of feedback. It can only be destructive when it serves the need of only one person.

4) It is directed toward behavior which the receiver can do something about. Feedback concerning things over which an individual has no control is of little value since it leads only to frustration on the part of the receiver.

5) It is solicited rather than imposed. Feedback is most useful when the receiver himself has formulated a kind of question which those observing him can answer.

6) It is well timed. The general feedback is most useful at the earliest opportunity after a given behavior in order to alter or re-enforce a behavorial course.

7) It is checked to insure clear communication. One simple way of doing this is to have the receiver rephrase the feedback and repeat it to the sender.

8) When feedback is given in a group, both the giver and receiver have opportunity to check with others in the group on the accuracy of the feedback.

Taking the above criteria into consideration, a rating scale has been constructed which can be used in the course of evaluating a feedback interview session. It is hoped by using this scale the staff can focus in on some of the specific problems in feedback techniques in order to evaluate their own and their colleague's performance under varying conditions.

Name of person being rated

Observe an individual giving feedback and rate his performance by using the coded scale below. Circle the number which most closely resembles your observations during this particular interview.

Coded Scale

5 = Often
4 = Occasionally
3 = Rarely
2 = Hardly ever
1 = Never
0 = Not applicable

1. The instructor used global statements instead of using specific data. For example he said "your clinical skills need to be improved" instead of saying "I feel your initial work-up of patients could be more thorough". 5 4 3 2 1 0

2. The instructor gave the student only partial feedback instead of communicating all available information. For example, he told him only about his weaknesses but did not mention his strength. 5 4 3 2 1 0

3. The instructor checked that the student understood the information given. For example, he asked "how would you interpret this information" or "how does this information effect your future plans?" 5 4 3 2 1 0

4. The student was encouraged to react to the information given. For example, the instructor asked "how does this information fit in with your opinion of yourself" or "do you think this evaluation represents what you can do?" 5 4 3 2 1 0

5. After giving negative information the instructor helped the student to find a solution to remedy the situation. For example he said what could be done to improve your history-taking skills" or "perhaps you could distribute your time differently". 5 4 3 2 1 0

6. The student was given support when he was defensive or upset. For example the instructor said 'I understand that this information upsets you" or 'Many students find the pressures of medical school trying" or "it is difficult to live up to different expectations". 5 4 3 2 1 0

TEACHING AIDS

Instructor's Notes

The variety of mechanical devices designed to assist the teacher makes imperative some means of evaluating their potential value in the local learning situation. The reading material attempts to provide a frame of reference and a check list to assist the participants in this selection process.

Instructional Aids

The following materials are available:

Handout: "Teaching Aids"

"Audio Visual Aids Rating Scale"

You may need:

As many mechanical and audio-visual aids as can be assembled with one or more appropriate programs.

Instructional Outline

1. Advance Organizer: "Teaching Aids" should be circulated the day before the program is to be undertaken.

2. Audio-visual aids that are reasonable in light of the time and hardware available to the faculty should be selected for evaluation. These could be audio-programs such as instructional tapes, audio-visual programs, sound slide programs or movies. Other types of aids or other methods of audio-visual communication, i.e. blackboard presentation, large illustrations, smaller illustrations, video-tapes, and the like can be used.

3. Brief demonstrations of aids designed to assist instructors (i.e. blackboard, overhead opaque projections, etc.) can be demonstrated. Participants may be asked to prepare a brief (5 minute) demonstration. Companies which sell teaching aids will usually supply equipment and/or demonstrations.

4. The audio-visual aids available should be reviewed and then weighted using the appended scale. Before or during the course of the evaluation the basic principles of learning and the basic principles in the use of audio-visual aids can be reviewed and their application to the specific aids being considered can be discussed.

TEACHING AIDS

When considering any audio-visual or any other teaching aid one must realize its purpose is communication. In the case of audio-visual aids this, in affect, is the use of some form of device or presentation in which information is encoded in a particular medium and then decoded by a receiver. It involves a source of the information, the specific message, channel, or method used to transmit the information and the receiver who decodes the information. In this case, a source, the message, and the channel are predetermined by the instructor in his choice of an audio-visual aid. The receiver or the student is not controlled as well and consequently the basic principles of learning must be taken into account in order to use the aid most appropriately.

These principles are that:

1) Learning is individual; consequently, various students will interpret or decode an audio-visual aid at various rates and in various ways.
2) Learning should be meaningful. The audio-visual aid used should, if possible, present a situation to the student that is meaningful and realistic.
3) Learning is emotional, consequently, attitudes effect the use of audio-visual aids. If the student feels that the aid is being used instead of the teacher making the effort on his own, he may very well be turned off by the use of a lot of fancy audio-visual aids rather than assisted in his learning.
4) Learning involves feedback and aids should either give feedback to the student or should be used in a fashion which allows the instructor to receive feedback about the aid.
5) Motivation is involved in learning. This is something that is extremely difficult to do anything about since it is an internal process. Optimally, however, audio-visual aids will help motivation by bringing the concepts closer to reality or clarifying concepts being communicated.

AUDIO-VISUAL AIDS RATING SCALE

Respond to each of the following statements by using the coded scale shown below. Circle the number which most closely corresponds to your observations.

Do not forget to write in the name of the person being rated and check ___ first if it is the first observed presentation and check ___ second if you are observing him the second time.

Coded Scale

5 = to a large degree
4 = to a lesser degree
3 = occasionally
2 = rarely
1 = never
0 = not applicable

Name of person being rated

(please check only one)

______________________________ Media used

__________ First

__________ Second

__________ Third

Planning and Selection

1.	A-V aid(s) directly served the planned instructional objectives.	5 4 3 2 1 0
2.	The unique dimensions of the media were served (e.g. motion or sequence for film or videotape; control of rate by student, etc.)	5 4 3 2 1 0
3.	A-V aid(s) helped clarify the concept or key relationships.	5 4 3 2 1 0
4.	A-V aid(s) brought the concept closer to reality.	5 4 3 2 1 0

5. The particular media used was the most efficient expenditure of instructional time. 5 4 3 2 1 0

6. A-V aid(s) was suitable to audience's level of experience, understanding and interest. 5 4 3 2 1 0

7. A-V aid used humor appropriately. 5 4 3 2 1 0

8. Participants could actively manipulate the materials being used for demonstration (when applicable) 5 4 3 2 1 0

Usage

9. Viewing conditions were optimal (e.g. illumination, visibility of print, tables, correct amount of detail, magnification.) 5 4 3 2 1 0

10. Hearing conditions were optimal (e.g. volume control, sound distortion, etc.) 5 4 3 2 1 0

11. Effective use was made of pointers and verbal explanation to direct or focus attention to key processes - cues were relevant. 5 4 3 2 1 0

12. Exposure to A-V aid was appropriately long or short. 5 4 3 2 1 0

13. Presentation was free of distracting and/or extraneous details. 5 4 3 2 1 0

14. A-V aid(s) was introduced and removed at an appropriate time during the presentation. 5 4 3 2 1 0

15. Instructors voice or gestures contributed to rather than distracted from the particular A-V aid. 5 4 3 2 1 0

Preparing Instructional Strategies

The intent of this unit is to bring closure to the sessions on Specific Techniques and to provide some practice in applying these to specific faculty needs. In keeping with its' purpose it is rather brief, but affords an opportunity for staff participations.

Instructional Aids

Handout: "Preparing Instructional Strategies"

Instructional Outline

Advance Organizer: Distribute "Preparing Instructional Strategies" one week before session.

1. Review written material
2. Review Unit on Teaching Techniques Overview.
3. Do Application Activities

-BREAK-

4. Review Application Activities Responses.
5. Restate Close Group Session

PREPARING INSTRUCTIONAL STRATEGIES

As was indicated in the material on preparing instructional objectives, teaching efforts typically should be directed toward the general instructional objectives and not toward the specific examples of behavior selected to represent each behavior. To focus upon insuring that students achieve mastery of the specific samples of behavior is to stress lower-order, or recall level learning rather than higher-order learning such as understanding, application, or analysis. To put it another way, stressing higher-order learning minimizes the probability that students will learn knowledge and/or skills and/or attitudes as ends in themselves and maximizes the probability that they will learn what they learn in such a way that they will be able to apply it in various settings and at varying levels of complexity.

Preparing instructional strategies, like preparing instructional objectives, is a two-step process:

1) Articulating learning activities that the teacher will organize to facilitate students' achieving the general instructional objectives; and,

2) Specifying the specific teaching actions the teacher himself will need to utilize to effectively implement the planned learning activities.

It is not particularly useful for a teacher to have developed an instructional plan that specifies objectives and learning activities to facilitate students' attaining those objectives if he is not cognizant of those behaviors or actions he will have to utilize to implement the plan; and conversely, it is not particularly useful for a teacher to have acquired a good deal of skill at a particular teaching technique, e.g., lecture, if he does not plan for what purpose and under what conditions it is appropriate to use it.

The attached chart gives an example of how to use this two-step process in planning instructional strategies.

PREPARING INSTRUCTIONAL STRATEGIES

GENERAL INSTRUCTIONAL OBJECTIVE	LEARNING ACTIVITIES	NECESSARY TEACHER ACTIONS
Understands the purpose of an initial interview with a new patient	Describe the purpose of the initial interview, emphasizing its usefulness as a diagnostic tool.	Organization and presentation of material regarding the purposes of the initital interview.
a.	Demonstrate how to conduct an initial interview with students observing.	Planning and implementing a demonstration interview.
b.	Arrange for each student to interview a patient, video-tape the interview and then review the tape, discussing with each student his performance.	Relating what is done in the demonstration to material present initially regarding the purposes of the initial interview.
c.	Repeat this procedure with each student until acceptable proficiency is demonstrated.	Anticipation of student difficult in conducting an initial intervie and working with students to help them handle those difficulties constructively.
d.	Engage in discussion with students about why you as the teacher encourage particular behavior in conducting an interview as opposed to alternative approaches.	Establishing and conveying of criteria for acceptable performan regarding conducting an initial interview.
	Encourage students to challenge and question your approach.	Establishing and conveying to students the rationale for your approach as opposed to others.
	Ask each student to practice teaching one or two other students how to conduct an initial interview.	Devising ways (e.g., asking provocative and/or drawing out questions) to involve students in productively engaging in discussi with you.

PREPARING INSTRUCTIONAL STRATEGIES (CONTINUED)

GENERAL INSTRUCTIONAL OBJECTIVE	LEARNING ACTIVITIES	NECESSARY TEACHER ACTIONS
	Engage in discussion with students regarding their teaching efforts, encouraging further consideration of any issues the teaching experience might have raised for them.	Drawing students out regarding any insights they might have gained; anticipating what those insights might be and being prepared to relate them to understanding the purpose of an initial interview.
	Invite each student to (a) modify his initial interview in light of what he has learned; and/or (b) encourage him to consider other clinical situations where the knowledge, skills, attitudes learned can be applied.	Being prepared to help students relate first performances and the understandings gained to later performances.
		Being prepared to assist students in relating the understandings acquired to other situations.

The chart is not intended to suggest that this is the way one ought to teach students to understand the purpose of an initial interview with a new patient. The point is to illustrate that once a teacher has identified general instructional objectives and proceeded to describe learning activities he might organize to facilitate students' attaining that objective, he needs to take an additional important step, namely, planning his own teaching actions.

Having completed a chart for each general objective in a unit or course, a teacher needs to plan for two kinds of evaluation procedures in order to complete his instructional plan. These procedures are described below.

1) It is generally desirable to plan to obtain feedback from students at the end of each session conducted and there are two kinds of feedback that appear to be particularly useful: feedback about whether or not students grasped the major points intended; and feedback about the effectiveness or lack of effectiveness of the teacher's teaching actions.

   Feedback can be collected by engaging in verbal conversation with students during the last 5 - 10 minutes of a session and/or by having students respond to a written form. The questions teachers ask students in a feedback session should be determined by the particular objectives the teacher had for that session. It is not very helpful for the teacher to ask the same questions each time he asks students for feedback since the major purpose of obtaining feedback is for the teacher to find out whether he achieved specifically what he wanted to achieve and if so, why and if not, why not.

   An additional advantage to obtaining feedback from students on a regular basis is that it helps create an open learning climate and facilitates students reaching closure at appropriate points in the course of instruction.

2) In addition to obtaining feedback from students on a regular basis, it is sound instructional practice to plan evaluation procedures (e.g., one or more written tests, having students give a demonstration, asking students to teach) that will be administered at the end of the series

2) (Continued)

of sessions designed to achieve each general instructional objective. These evaluation procedures should be directed by the representative samples of the specific types of student behavior that has been identified as acceptable evidence of attainment of the objective. An example is described below.

General Instructional Objective

Understand the purposes of an initial interview with a patient.

One Sample of Specific Behavior That Would Indicate Attainment of the General Instructional Objective

Elicits a relevant and adequate history within a reasonable length of time during an initial interview with a new patient.

Evaluation Procedure

Each student conducts an initial interview with a patient he has not seen before. The interview is observed by a practicing physician and the performance of each student is assessed in terms of previously agreed upon criteria for (1) relevant and adequate history; and (2) reasonable length of time for an initial interview.

Note that evaluation procedures used should (1) test for the specific behaviors identified as being acceptable evidence of the attainment of the general instructional objective; and, (2) be unfamiliar to the students being tested (e.g., interview a patient never seen before).

In addition to taking the steps advocated so far, two additional procedures can be very helpful in insuring that teaching will, in fact, be purposeful action. They are described below.

1) Before engaging in actual teaching activity, many teachers find it helpful to identify two or three colleagues whose thoughts they respect to use as sounding boards to test both the clarity and

feasibility of their instructional plans. The reactions and advice of others can help the teacher make sound last minute revisions prior to teaching.

Guidelines to facilitate the teacher using colleagues as resources are attached to this packet.

2) It is desirable for teachers to get in the habit of "practice teaching" periodically in order to try out new teaching behaviors and/or to get some feedback on behaviors they use regularly but want to evaluate more closely. The following procedures have been found to be particularly valuable in facilitating this activity: teachers select a short (e.g., 15 minutes) but representative portion of a plan they have prepared practice teach it to a group of colleagues who role play students; after teaching the mini-lesson, they ask the "students" for feedback both about how effectively the content they wanted to convey was presented and about what they did as teachers that was particularly effective or ineffective; the teachers then spend a few minutes using the feedback they received to re-plan the lesson, after which they immediately teach it again to, preferably, a different group of "students". Feedback is given after the reteach as well.

Variations of the above procedure can be formulated to make it suitable for a wide variety of situations. Not only is it a useful way for teachers to improve their teaching, it can contribute a good deal, when seriously used, to creating an open, purposeful climate among the faculty of any institution.

Karen J. Connell
February 1971

APPLICATION ACTIVITIES

Using one of the two general instructional objectives you have already written, complete the following outline as completely as you can.

I. Restate your general instructional objective

II. List five or six specific behaviors that students could demonstrate that would indicate to you that the above objective had been attained.

a.

b.

c.

d.

e.

f.

III. Describe a set of learning activities that you would organize to facilitate students' achieving your general instructional objective. Be sure that the learning activities you select are clearly related to the general instructional objective you identified in item I above.

III. (Continued)

IV. Specify the teaching actions you would want to take to effectively implement the learning activities you described above.

Note that teaching actions include activities like anticipating what students already know, organizing material for presentation, making lecture presentations, conducting discussions for various purposes, asking various kinds of questions, working with students individually, demonstrating skills, making clear the relationship between theory and practice, and anticipating student response to teaching actions.

Be as specific as possible in specifying the teaching actions you would want to take to implement the learning activities you have described in III above.

V. Describe at least two evaluation procedures, other than written tests, that you would use to determine whether or not you had achieved your general instructional objective. Remember, evaluation procedures should be directed by the representative samples of specific types of student behavior that you identified in II above as acceptable evidence of attainment of the objective.

VI. Meet with two of your colleagues to review the plan that you have prepared as a result of completing this outline. Be sure to use the guidelines suggested on the attached for utilizing colleagues as resources in instructional planning.

Instructor's Notes

Principles of Curriculum Construction and Development

Part of the responsibility of all teaching staffs is the constant reassessment of their instructional package or curriculum. No single report or paper can begin to approximate the way in which a curriculum is formulated. However, it is possible to outline briefly, the bench marks of good curricula design. The handout attempts to do this.

Instructional Aids

Handout: "Principles of Curriculum Construction and Development"

Instructional Outline

Advance Organizer:

1) "Principles of Curriculum Construction and Development" can be circulated a week prior to the session to allow time for some thought.

2) Basic principles can be reviewed and the teaching program as it exists at the time of the staff development session can be evaluated in their light.

3) Adjacent related teaching programs such as those in other departments can likewise be evaluated.

4) A repeat session from three to six months later could be organized to determine whether or not the principles have been applied or are being applied. If problems exist they can perhaps be pin-pointed as a first step in their solution.

Principles of Curriculum Construction and Development

THE PURPOSE

As a result of the material presented in the following paragraphs, the attending staff should be better able to:

1) evaluate their own teaching program within the context of the teaching programs in their own and associated institutions.

2) identify the strong points and the week points of their programs.

3) organize their own program for a maximum efficiency.

The first set of basic principles that apply to any educational program are as follows:

1) The objectives of the program should be defined as concisely as possible and as completely as possible.

2) They should be reality orientated; objectives should be reasonable considering the time the student is going to be exposed to the situation, the materials and methods available, the background of the student, the number and background of the faculty. The objectives optimally should be defined in all three domains: cognative, psychomotor, and affective. The faculty should have some concept of these domains, their differences, their similarities and their interrelations.

3) The goal should be achievable, measurable and acceptable both to the faculty and the students.

4) Evaluation tools should be formulated, based upon the objectives and should be reliable, valid, practical, and objective.

5) The learning experiences presented to the students should follow the objectives. If there is a limited amount of time available, and priorities determine that the student should spend his time learning to evaluate orthopaedic problems, he should be allowed to do this and not be tied-up with other experiences (assisting in surgery, scut work) that do not contribute to the attainment of the objectives.

6) Systematic re-evaluation of the objectives must be incorporated into any program. Without this a program stagnates and can become less effective as time goes on.

Having taken the above principles and applying them to your own individual programs, a certain amount of organization is helpful in producing efficiency in the program. Important changes in human behavior are not produced over-night. Consequently, it is rare that a single learning experience has a profound influence on the learner. In order for educational experiences to produce an effect, they must be organized so as to re-enforce each other. Consequently, something else that must be considered is the goals of other portions of the teaching program. One is dealing with interns or students who may be going from department-to-department; optimally, the learning experiences they have in one department should re-enforce the experiences in another.

There are three major criteria to be met in building an effectively organized group of learning experiences:

1. Continuity. Continuity in effect refers to the reiteration of important principles. If for example, the appropriate and efficient use of diagnostic aids such as a laboratory and x-ray was considered to be an important goal in an intern program, this principle should be a part of the goals, not only of orthopaedics, but alos of medicine, surgery, and pediatrics within particular institutions. In this fashion. Skills will be brought into repetitive and continuing operation and their development will be reinforced.

2. Sequence. Sequence is related to continuity but goes beyond it in that it emphasizes the succession of experiences built on preceding ones and progressing more broadly and deeply into the matters involved. Repetition does reinforce specific learning, but in order for the student to grow in a concept the use of particular principles at higher levels of application should be emphasized during the course of the sequence.

3. Integration. Basically this refers to the students being exposed to experiences that allow him to apply principles used in one discipline or in one situation to other situations. Here again, the goals of one department or one discipline should be integrated if at all possible with those of other departments in so as overlap is feasible.

In organizing a teaching program the basic elements can be identified that apply to several different aspects of the curriculum. These can serve to be the organizing threads of a teaching program. For example, if one aspect of a teaching program is to develop "professional attitudes" this is an element that should be identified in various aspects of the curriculum. An effort should be made to instruct the student in this element and evaluate him in this element as he progresses through the training program.

Another aspect in curriculum construction is the basic organizing principle. Different principles are applied depending on the subjects involved. For example, history courses frequently use a chronological principle. With a complex discipline such as medicine, it is more common to use increasing breadth of application, analysis synthesis, problem solving or sometimes anatomical or systemic organization applied to curriculum structure.

The structural elements used in the organizing learning experiences also have to be identified. These sometimes can be specific subjects, broad fields, core curriculum or some sort of undifferentiated structure. Structure may depend on the time allowed, cooperation with other aspects of the teaching program, facilities available, the type of student being dealt with.

In summary, the actual development of a curriculum goes through the following steps:

1) agreeing upon the general scheme of organization (specific subjects, broad fields, core programs, etc.).

2) agreeing upon the general organizing principles.

3) agreeing upon the basic unit to be used (daily lessons, sequencial topics, teaching units).

4) developing flexible plans that can be used to assist the faculty in structuring their individual teaching situations.

5) obtaining feedback from both faculty and student group in order to plan the curriculum most effectively.

Instructor's Notes

Evaluation

The concluding part of the cybernetic cycle (objectives, methodology, evaluation) deals with judging the effectiveness of what has or is taking place. A brief general overview of evaluation is first included, followed by a self-instructional program which gives practice in the use of evaluation techniques.

Instructional Aids

The following materials are available:

Handout:	-	"Evaluation" "Selection of Evaluation Techniques" "Evaluation Instruments and Learning Outcomes" "A Revised Taxonomy of Intellectual Processes"
Trigger Film	-	"The Oral Examination"

You may need:

Blackboard
16mm Projector
Overhead Transparency

Instructional Outline

Advanced Organizer: Distribution of the "Evaluation" Handout.

1) Discussion of what constitutes effective evaluation.

2) Distribution of "Evaluation Instruments and Learning Outcomes" and the discussion of the "Selection of Evaluation Techniques", have participant complete for next session.

3) Discussion of selection rationale for participants.

4) Have each participant select at least one learning situation in which he finds himself either as a teacher or learner. With that situation --

   a) develop an objective.
   b) prepare at least one evaluation item (part of check list, multiple choice question, etc.) using "Evaluation Instruments and Learning Outcomes" as a base.

5) Distribute "Evaluation Instruments and Learning Outcomes" for use in next session.

6) Discuss items prepared by putting an overhead transparency for total group critique.

EVALUATION

In any learning situation evaluation is an essential portion of the teaching learning process. It is an essential portion of any program in order to determine first, what the learner needs to know; second, what the learner has actually accomplished in the learning situation; third, whether or not the learning situation is following the objectives set out in the course. This points up one essential aspect of any evaluation procedure, and that is that it must follow determination of the objectives of the learning situation. Too often a course is tailored to the evaluation tools available rather than being tailored to objectives. Assumptions about what is actually accomplished in a learning situation are weak foundations upon which to have a teaching program. Data must be obtained in order to objectively determine accomplishments.

THE PURPOSE

As a result of the program formulated in the following paragraphs, the attending staff should be better able to:

1) Design evaluation tools based upon defined objectives in the learning situation.
2) Analyze their present evaluation tools on the basis of the essential characteristics of evaluation systems and modify if necessary, their evaluation methods on the basis of their analysis.
3) Analyze and improve if necessary, their ability to evaluate their learner's and their learner's accomplishments in their everyday teaching roles.
4) Analyze and improve if necessary, their ability to produce written multiple choice questions of an appropriate type for their needs.

The first and sometimes the most difficult step in formulating an appropriatative evaluation tool is determining exactly the objectives of the course involved. Consequently some time may have to be spent in difining concisely and adequately the objectives of the learning situation. Once these are defined it is much easier to determine the type of evaluation tool to be used and the specifics of the evaluation tool to be used.

Presuming well defined objectives, there are five common characteristics of any evaluation situation which must be identified before applying an evaluation mechanism. To define these accurately can be extremely difficult. Educational psychology frequently produces a morass of statistics and data in the course of dissecting an evaluation system. No attempt will be made to reproduce such methods in this particular course. From a practical point of view, we believe it is sufficient for the attending staff to familiarize themselves with these concepts and apply them in the course of formulating evaluation tools without going through a lot of statistical confirmation of their laborers unless they are specifically so inclined:

The five basic characteristics we were speaking of are:

a. Reliability. In short reliability of an evaluation tool is the determination of whether or not it actually tests what it is suppose to test. This may seem to be a bit basic but at times this becomes a problem. To use a simple example, if you want to evaluate how well a resident applys a plaster cast, the best way to do it is to have him actually apply a cast. His ability to describe either in words or diagrams how a cast can be applied is not very reliable. Some individuals may be able to describe this very accurately and completely, but when actually they have to perform and not be able to do this very well. This is not an unknown problem of evaluation tools in medicine. Too often one thing is taught in a course and another thing is requested in the evaluation tools, consequently, any evaluation technique used must be reliable in that actually tests and evaluates very specifically what it is you want the individual to be learning.

b. Validity. The validity of an evaluation tool is in effect a statement that what it is that one is testing is pertinent to the overall subject that one is evaluating. One of the best examples of validity is perhaps pointed out by the complaint of many practicing physicians that certifying examinations, state board examinations or national board examinations are testing things which are not "pertinent" to the practice of medicine. They feel that some faculties emphasize basic sciences and esoterica to the exclusion of practical methods and applied methods in use. In short, one must be certain,

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as nearly as possible that what one is asking the student to do in the course of an evaluation procedure is related to what one expects the student to be able to accomplish after the learning experience.

c. As much as is humanly possible, an evaluation process should be objective. In other words, the data that the evaluation process produces hopefully should be able to be measured in some objective fashion. In some forms of evaluation this is relatively easy. In other forms it is far more difficult. An example of objectivity or attempts at obtaining objectivity most familiar to the faculty would be the attempts at standardizing the oral examinations in the American Board of Orthopaedic Surgery Certifying Exam. Admittedly any oral examination lacks the amount of objectivity that a written examination does, since the interpretation of the response must be made by the examiner. However, by using the standardized material, and by spending some time with the examiners and going over some of the basics of evaluation, attempts are being made to increase the amount of objectivity in the examination.

d. The fourth component of an evaluation process and sometimes the most important is its Practicality. To use an extreme for an example, the optimal way perhaps of certifying an orthopaedic surgeon would be to have an examiner follow him about for a period of time, say a week or a month. A trained examiner conceivably would be able to truly evaluate the man's ability to practice orthopaedic surgery. It is obvious that this is not a practical method of evaluation. Another example is that of evaluating a man's surgical skill. Optimally he should be evaluated both in situations of routine cases, very involved cases, and those in which the unexpected occur. To construct such a situation is not only practical, it is factually not legal. Consequently, any evaluation tool used must be reasonable in terms of the facilities and personnel available, time allowed and all of the other components that enter into "practicality".

e. The fifth component of evaluation is "Impact". This refers to the effect the procedure has on the students learning. Optimally a procedure should be used that allows the student to receive feedback and correct his using the procedure. Evaluation procedures poorly constructed and irrelevant to the learning situation can have negative impact. An example of getting feedback from an evaluation program is the policy that some programs have of requiring the resident to review the in training examination as a group to discuss the questions and answers.

Another important aspect of evaluation that should be considered is the fact that an evaluation maybe directed in the sense that it is a structured test situation or indirect in that an individual's activities outside of a structured evaluation situation can be measured. A gross example might be the number of a particular view of x-ray that would be ordered subsequent to a lecture to a group of house staff or students. If one felt it is important to obtain an internal oblique view on all ankle injuries, and one spent the time talking to the house staff or one's colleagues about this, one could then compare the number of such view that were ordered both prior and subsequent to your efforts. If this did not increase and if the x-rays were not as a cause, one would then assume that in spite of your efforts you had not made the point. This type of evaluation can be used frequently in the course of teaching residents or students.

An evaluation process is an essential at any level of the educational system. Its use in undergraduate teaching is quite well known (though not perhaps as well understood as it could be). In the course of the orthopaedic training study, we find that evaluation on the graduate or resident level is quite variable from program to program. The big or major evaluation for most of us is our certifying examination which in spite of its problems and possible weak points is so far superior to other specialties that we can be justifiably proud of our Board's efforts. Necessity for evaluation and continuing education would, I hope, be obvious. This however is "recertification." Nevertheless, if one intends to have an ongoing teaching program regardless of the level one is faced with the fact that evaluation is an integral part of the program whether it is accomplished locally or nationally. It is hoped that in the course that you can gain an improved concept of evaluation so that in whatever context used it will be done properly and efficiently.

Another concept to be considered when discussing evaluation is that of taxonomy. This has been studied extensively by many investigators. In effect, it is a method of categorizing questions or inquries with specific respect to the intellectual process being evaluated. The simplest form of taxonomy is a three level taxonomy, namely 1) rec
2) interpretation and 3) problem solving. The higher levels of taxon
(interpretation and problem solving) are based on the lower level (rec
The reason that this is discussed at all is that evaluation methods an

that in the course of their evaluation they must be given tasks that require problem solving. This can become extremely difficult when one deals with complex subjects. Frequently, an individual may ask a question that they feel is requiring problem solving. However, if the person of whom the question is asked is knowledgeable in the field the question may simply be at a recall level based on a key phase. Likewise if one asks a question requiring the interpretation of some sort of objective data (in orthopaedics not infrequently x-rays or pathologic slides, conceivably gait films, or photographs) one must be certain that what is required of the individual asked is that they actually interprete data and not give one a lot of recall information based on something that he gained from data they presumably were supposed to interpret. Specific examples may help.

A. An individual in an orthopaedic residency training program is presented with an x-ray of a fracture that they had just treated and asked "how would you treat this." Rather than interpreting the x-ray and analyzing the fracture, they may simply recite what they just had done. Therefore, what might have seemed to be a question that involved interpreting an x-ray and then problem solving the situation presented in the x-ray was actually no more than recall of what had been done recently.

B. An individual may be asked a question "how do you treat idiopathic scoliosis with a 60 degree right dorsal curvature?" The questioner may consider this a problem solving exercise, however, unless the person being questioned has to defend their thesis, all they may do is simply recite that by rote what they recall is the "way it is done" in their particular program. Again, what might seem to initially be a problem solving exercise is no more thatn recall of a "cook book" solution.

It becomes somewhat obvious that the construction of questions of higher taxonomic levels can be extremely difficult since in order to do so appropriately, the individual must be presented with the p problem new to them that requires their higher intellectual process for its solution and not just the recall of a vast amount of data or experience that they may have accumulated throughout their training or practice.

A common evaluation process is the multiple choice question. Since these are used so frequently in many level of evaluation, this specific form of written evaluation is expanded upon.

Principles of multiple choice question construction.

1. The question is composed of a stem (statement), an answer, and 3 or 4 distractors (little is gained by adding more distractors).

2. Avoid double negative, trick wording, etc. in the stem. Try to avoid asking negative questions (which of the following is not etc.)

3. The answer and the distractors should be of comparable length and grammatical construction.

4. A good answer can be objectively documented.

5. A good distractor incorporates a common error or misconception in its structure.

Selection of Evaluation Techniques

Purpose: To select the most appropriate evaluation technique to measure the achievement of a given objective.

Instructions:

Each of the following items describes an educational objective followed by a different evaluation technique.
First you are to select for each objective the one best method for evaluating the attainment of that objective.
Secondly you are to indicate if the chosen technique measures primarily (1) cognition; (2) affect; (3) a psychomotor skill or (4) a communication skill.
Thirdly state your reason(s) for having selected the chosen technique. The following criteria should be considered when selecting an evaluation technique to measure any aspect of medical competence:

1. Objectivity: any technique for measuring medical competence must yield objective data, i.e. independent observations of different experts must agree. An examination is objective when, for example, different examiners independently arrive at closely similar grades for each series of essays or oral examinations or when different experts independently select the same alternatives as the best answers to multiple choice questions.

2. Relevance: the examination is relevant if the behavior required to respond is related to the objectives of the course. For example, if the objective is to measure the student's ability to arrive at a correct diagnosis the selected evaluation method should measure the student's ability to solve problems; the examination cannot be regarded as relevant if the student need only to recall facts in order to respond satisfactorily.

3. Efficiency: some evaluation methods can be used with many students at the same time and can be machine scored; others have to be administered individually and scored by hand. Some compromise between available time for testing, scoring and relevance must be made.

4. Specificity: some evaluation methods give information about the student's knowledge of "what to do" but do not reveal the reasons for doing it. For example in a true-false test the student merely indicates whether the statement is correct or incorrect but has no opportunity to present his reasons for his choice. Methods eliciting reasons for responding are usually more time consuming than methods focusing only on the correct response, but they produce more complete information about the student.

Sample Item.

The fourth year medical student should demonstrate that he can select suitable diagnostic procedures for 80% of the patients seen on ward rounds.

A. Administer an oral examination at the end of the clerkship and ask the following kind of question: Look at the chart of this patient whom we have seen on ward rounds and whose work-up is incomplete. What additional kinds of investigations would you suggest and why?

B. A brief verbal description of the patient's chief complaint is given and the student has to list diagnostic procedures in writing.

C. House staff (the resident) has to rate students on his ward on their ability to select suitable diagnostic procedures.

D. A brief written description of the patient's chief complaint is given followed by multiple choice questions about suitable diagnostic procedures.

Answers.

The best evaluation technique is A .
The chosen technique measures Cognition .
The reason for selecting this technique is that it permits sampling of several patients seen on ward rounds. Permits eliciting information not only about what to do but also about the reasons for doing it.

For items 1 through 6 record your answers on the enclosed Answer Sheet. After responding to each question check your answers against the enclosed key.

Selection of Evaluation Techniques

Select 1 (one) answer for each problem.

1. The second year medical student can differentiate between normal and abnormal laboratory test results from serological and complete blood-count studies in 90% of the cases.

   A. Provide the student with a list of serological and C.B.C. components. They must enter the normal range of values for each component for a given age and sex of patient.
   B. Excerpt several serology and C.B.C. lab reports which the student must identify as normal or abnormal.
   C. Administer a multiple choice examination presenting various components of serological and C.B.C. laboratory studies.
   D. Have the student present a case study based on a patient whose serological and C.B.C. studies were abnormal.

2. The nurse in the Coronary Care Unit will perform at least 4 of the 5 necessary functions to evaluate the status of a patient admitted with the classic symptoms of myocardial infarction.

   A. Ask the nurse to list all procedures in writing that are necessary to evaluate the status of the patient.
   B. Give an oral examination and ask the nurse to describe the functions to be performed.
   C. Show a film depicting a myocardial patient on admission to the CCU and supply the student with a list of nursing functions. Have her rank those in the order in which she would perform them.
   D. Observe the same nurse on 5 consecutive mornings admitting new patients to the CCU.

3. The intern can differentiate between acute myocardial infarction, myocarditis and arrythmias in 100% of the cases.

   A. Identify EKG strips that belong to patients with myocardial infarction, myocarditis and arrythmias.
   B. List the findings of all three conditions in 3 separate columns.
   C. After viewing EKG strips that belong to MI patients have the intern explain what made him decide that these patients have MI.
   D. From a printed list of findings check those that are exhibited only by patients with arrythmias.

4. Upon completion of a one-week continuing education course for general practitioners, the physician will exhibit his ability to correctly diagnose stroke in 90% of the cases.

   A. Ask the GP-s to examine several ward patients and assess the possibility of stroke.
   B. Provide each GP with the description of five patients who suffered stroke and ask him to select from a list of treatment procedures those that he would employ.
   C. Audit the GP-s charts six months after the completion of the course to see how he managed stroke patients.
   D. Provide each GP with a description of five patients having symptoms similar to stroke. The GP must provide differentiating clinical findings for each patient.

5. The fourth year medical student should demonstrate attention to the social aspects of the patient's condition.

   A. Audit 10 histories taken by the student to check if information about the patient's living and working conditions is recorded.
   B. Give an oral examination and observe if the student includes consideration of social factors, without prompting, in planning treatment.
   C. Observe the student during ward rounds at least 5 times.
   D. Ask the attending man, who instructs the student, to rate him on his sensitivity to patients.

6. At the end of the surgical internship year the intern can perform an oral endotracheal intubation.

   A. Have the intern list all steps involved in an endotracheal intubation.
   B. Observe the intern intubate an anesthetized patient in surgery.
   C. Use a checklist to observe the intern intubate a patient.
   D. Ask the intern to discuss conditions that may interfere with the successful endotracheal intubation of patients in surgery.

Selection of Evaluation Techniques

Answer Sheet

1. The best evaluation technique is ______.

   The chosen technique measures ______________________________.

   The reason for selecting this technique is ____________________

   ____

   ____.

2. The best evaluation technique is ______.

   The chosen technique measures ______________________________.

   The reason for selecting this technique is ____________________

   ____

   ____.

3. The best evaluation technique is ______.

   The chosen technique measures ______________________________.

   The reason for selecting this technique is ____________________

   ____

   ____.

4. The best evaluation technique is ______.

   The chosen technique measures ______________________________.

   The reason for selecting this technique is ____________________

   ____

   ____.

5. The best evaluation technique is ______.

The chosen technique measures ______________________________.

The reason for selecting this technique is ____________________

____

____.

6. The best evaluation technique is ______.

The chosen technique measures ______________________________.

The reason for selecting this technique is ____________________

____

____.

Selection of Evaluation Techniques

Key to Exercise 4

1. Technique chosen: A or B
Cognition
Reason: The objective calls for recall and both methods A and B sample recall in a paper and pencil format suitable for mass administration. Methods A and B are objective, relevant and efficient.

2. Technique : A
Cognition
Reason: Both methods A and D are relevant; method A is chosen because it is more efficient than observing nurses on the ward. By selecting method A we are assessing only cognitive functions while method D would also permit assessment of affective functions i.e. the nurse's interpersonal responses to patients.

3. Technique: A
Cognition
Reason: Both methods A and B are relevant but method A requires interpretation while method B requires only recall. Whenever possible testing higher level cognitive functions should take precedence over testing lower level functions.

4. Technique: D
Cognition
Reason: Method D is selected because it is most relevant. Methods B and C test the ability to treat NOT to diagnose stroke. Method A is less specific than method D.

5. Technique: A
Affect
Reason: Method A is selected because it focuses on real life behavior with 10 patients in contrast to method B. Observations during ward round may not reveal relevant behavior (method C) and the attending man may have no basis for judging the student's sensitivity objectively (method D).

6. Technique: C
Psychomotor skill
Reason: Both methods B and C are relevant but method C is more objective because the observer uses a checklist.

EVALUATION INSTRUMENTS AND LEARNING OUTCOMES

Types of Items	Examples of Learning Outcomes that can be measured
Objective type test items	Knowledge of - terminology specific facts methods and procedures principles Recognition of - correctness of statements of fact differences between fact and opinion limitations of data cause and effect relationships Ability to - apply facts interpret data interpret cause and effect justify methods and procedures differentiate among appropriate choices KNOWLEDGE, RECOGNITION, RECALL, DIFFERENTIATE, ETC.
Structured oral and interpretive exercises	Recognition of cause and effect relationships application of principles relevance of arguments tenable hypotheses valid conclusions unstated assumptions limitations of data and fact adequacy of procedures RECOGNIZE AND ANSWER TYPE ITEMS
Restricted response essay	Ability to - explain cause and effect relationships describe applications of principles present relevant arguments formulate tenable hypotheses formulate valid conclusions state necessary assumptions describe the limitations of data explain methods and procedures RECOGNIZE AND FORMULATE

Types of Items	Examples of Learning Outcomes that can be measured
Extended response essay, structured oral	Ability to - produce, organize and express ideas integrate learnings in different areas create original forms (e.g., design an experiment) evaluate the worth of ideas RECOGNIZE, FORMULATE, EVALUATE
Work and observation forms	Skill in - use of equipment planning handling situations and personnel performing specific tasks and/or tests Habits of - initiative creativity persistence dependability Social attitudes regarding - concern for welfare of others respect for persons and property sensitivity to social issues Scientific attitudes including open-mindedness willingness to suspend judgement sensitivity to cause-effect relationships inquiry Adjustments to - peer relationships praise and criticism authority emotional trials

Selection of Evaluation Techniques
Exercise 1

Puropse: To identify the advantages and disadvantages of different kinds of evaluation techniques

Directions: Different kinds of evaluation methods are listed in Column A and a list of ADVANTAGES and DISADVANTAGES are shown below. Consider each evaluation method separately and record in front of each method the number corresponding to all of those advantages that apply to a given method. Next, record after each method the number corresponding to all the disadvantages that apply to a method.

Advantages	Column A Evaluation Methods	Disadvantages
____________	A. Multiple choice questions	____________
____________	B. Completion or short answer questions	____________
____________	C. Practical exam	____________
____________	D. Essay exam	____________
____________	E. Oral exam	____________
____________	F. Observational reports	____________
____________	G. Rating scales	____________
____________	H. Write-ups, case studies or project reports	____________

Advantages

1. Can test skills involving all the senses
2. Flexibility in moving from strong to weak points
3. Can sample content widely
4. Possible to include common misconceptions
5. Good for testing problem-solving ability
6. Relatively easy to construct
7. Opportunity to test ability to organize
8. Opportunity to find out how candidate arrived at answer
9. Good for measuring detailed, factual recall
10. Scoring procedures can be kept constant
11. Economical for large groups

Disadvantages

1. Inadequate standardization
2. Severe limitation of the content that can be sampled
3. Cues are provided that are unavailable in practice
4. Extended contact with student required for a valid estimate of his performance
5. Opportunity for guessing
6. Negligible feedback to student
7. Construction is time consuming
8. Excessive time required for scoring
9. Undue influence of irrelevant factors on performance
10. Difficult to reproduce results
11. Difficult to obtain objective judgments of perfromance

A Revised Taxonomy
# of Intellectual Processes

COGNITIVE DOMAIN

Questions can be categorized by the thought process required to formulate an answer in response to them. The level is dependent on the respondee's sophistication, what is recall for the clinician maybe problem solving for the second year medical student.

It should be obvious that the system is hierarchy since all lower levels are contained in upper level classifications i.e., recall and simple interpretation are required for problem solving and evaluation.

LEVEL I: RECALL

Questions testing primarily the Recognition or Recall of isolated informatory; such questions require predominately an effort of memory. They may include: recognition of typical morphologic lesions, or recall of specific facts, generalizations, concepts, principles, processes, procedures, or theories. Whether or not it is specifically mentioned, such questions imply "what is X?"

Recall inquiries in oral examinations are frequently calls to "tell me what you know." Sample questions might include:

What medications have you ordered?
What diagnostic test is appropriate for ...?
When Mr. X was admitted what other complaints
did he have?

LEVEL II: SIMPLE INTERPRETATION

Questions testing primarily SIMPLE INTERPRETATION OF LIMITED DATA. Such questions require more than simple recall, but less than problem solving. They include questions that require translations from one form of specific verbal tabular, morphologic or graphic data which are new to the student, interpretation or extrapolation from such data and recognition of the constituent elements and relationships among such data. Questions at this level will ordinarily be asked "how do you interpret X? What does it imply? Knowing X to be true, what would you expect to be true of Y?"

Why does he walk that way?
Why does a femoral shunt sometimes work?
Why doesn't this kind of traction work?
What do the results of this test tell you about his problem?

LEVEL III: PROBLEM SOLVING AND EVALUATION

Questions testing primarily the APPLICATION of knowledge to the solution of a specific problem and the FITTING TOGETHER of a variety of elements into a meaningful whole. Items of this type maybe based on clinical reports which require the student to develop a differential diagnosis or a therapeutic regiment. Alternatively, such questions maybe based on a case report of a type prepared for the typical clinical-pathological conference or research report or the presentation of a theory together with evidence, and will require the student to evaluate the total presentation.

Examination items which fit here would include:

Would you be willing to risk X in this situation?
Would a Symes amputation be better in this case?

Illustrations of Oral Examination Questions

CHILDREN'S ORTHOPAEDICS

Recall Series	"Tell me about club foot?" "What age do you start treatment?" "How long do you keep this up?" "What are criteria for stopping therapy?" "How do you do tendon lengthening?" "At what age?" "What's a rocker bottom foot?"
Interpretive Skill (x-ray)	"What do you see?" "Do you think this hip is normal?"
Problem Solving	"What is differential diagnosis?" (Candidate asks for additional information and specific items are provided by examiner.) "Here is child one month later--now what do you think?" (Shows follow-up x-rays and answers further questions) "Here is child one year later---now what do you think?" (Follow-up films and additional information provided on request)

ADULT ORTHOPAEDICS

Recall Series	"Give three causes of aseptic necrosis." "If you know the cause, what is the treatment?" "List the three most common complications of post-op hip fusion."
Interpretive Skill (x-ray)	"What do you see?"
Problem Solving	"What do you think this is and what would you do for it?" (Shows x-ray, gives additional information as candidate requests it.)

[illegible]

[illegible] TIME: 11:07 MINUTES

[illegible] PH.D. and BRIAN [illegible], M.D.
[illegible] BY THE OFFICE OF EDUCATIONAL RESOURCES, UNIVERSITY OF ILLINOIS
[illegible] COOPERATION [illegible]
[illegible]
[illegible], PUBLIC HEALTH SERVICE, [illegible]

[illegible] USE OF TRIGGER FILMS

[illegible] the new genre of Trigger Films consists of a short (one to [illegible]) film which caricatures a fairly common occurrence. Usually the film [illegible] a fragment of a larger series of related events, long enough to [illegible] some structure, yet short enough to permit the viewer to continue [illegible] beginning and ending. [illegible] shot, the camera work places the viewer [illegible] the event rather than as a witness to it. The key to the [illegible] of Trigger Films that makes it so successful in group work is the generation of [illegible] strong that an individual participant must react in some way. [illegible] the reaction is [illegible], other times anger, but always [illegible].

[illegible], the films serve best as an introduction to a multitude of [illegible] which are presented here in the film guide. The individual [illegible] can adapt and combine these in any fashion that meets the needs of [illegible] group. For example, one might use the "Presentation of [illegible]" to introduce and review with the participants a check list [illegible] approach. Then, use the "Bad Patient" sequence (Situation [illegible]) [illegible] sequence, asking individuals to assume the role of the [illegible] and others to assume the role of a senior attending or [illegible], who is given the task of providing feedback regarding [illegible] performance. The variations on the general theme seem to be [illegible] appear to work best when the following general rules are followed:

[illegible] Explain ground rules. Participants should be informed that the situation is not a complete story and that there is no pre-determined "correct" answer to the discussion. It may be suggested that the participants concentrate on what is happening, why it is happening, and how they react to the situation.

2) Use familiar settings. While the subject matter is of [illegible] importance, the most successful Triggers seem to be those which are the most familiar (and most comfortable) to the participants. This also helps place the participants within the Situation rather than as witnesses to it. Identifying clues, such as locale, i.e., equipment, materials, attire, etc., should be those which are most familiar to the participants.

3) Use negative examples. Portraits of what not to do seem to generate more reaction, probably because we all believe we know the right thing to do. The leader should acknowledge this fact the first time the question arises although it is probably not a good idea to emphasize that notion in the beginning.

An additional reason for the negative example is that discussion based on the theme "It would be better if –" seems to be more inviting than "That was good, because –". Also, the [illegible] should be [illegible] to the fact that the negative approach provides for two avenues of approach for immediate [illegible]: "this is what was wrong," and, "this is how it could be [illegible]". The participant may choose the one which is most comfortable to him.

[illegible] Trigger [illegible] is portrayed in the [illegible] by [illegible] of the [illegible] or [illegible] of peripheral type is involved [illegible]. Answering questions [illegible] the ability of the group to identify what they see [illegible] and how to [illegible] with these peripheral concerns.

[illegible]. Perhaps the [illegible] purpose of the Trigger Film [illegible] and group [illegible]. If one generalization [illegible] from previous experience with Triggers, it is that the [illegible] in which the group [illegible] the approach [illegible] participate [illegible] the most successful.

[illegible] these general [illegible] to local situations [illegible] might [illegible] discussion around [illegible] rather than what [illegible] there. [illegible] by the [illegible] of the individuals involved [illegible].

[illegible] most fruitful [illegible], perhaps, might be one in which [illegible] viewing the films, [illegible] to role play [illegible] value of [illegible] individuals to [illegible] for using Triggers.

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[illegible]

[illegible]

[illegible] Use of Trigger Films in Discussion Groups by Carl J. Olson, [illegible]

[illegible] Instructional Guide

[illegible]

[illegible]

[illegible] Instructional Guide

[illegible] concerning anything pertaining to the objectives on the [illegible] Guide.

[illegible]

It is suggested that viewers do not take notes while the segments are being shown.

[illegible]

[illegible]: "Objectivity."

[illegible] of the Orthopaedic Program is introducing medical students to [illegible] objectives of orthopaedic [illegible] training, as conducted by [illegible] from his presentation that he has thought [illegible] for specifying in such a fashion that he communicates [illegible] involved are required. Students react to the confusion as one might [illegible]

[illegible] the effect of poorly defined objectives on students.

[illegible] this segment and participating in the discussion, the viewer will be able to:

1. identify poorly defined objectives
2. explain the need of students for properly defined objectives.
3. make a commitment to greater specificity in preparing objectives in own situation.

[illegible]: "Consideration!."

An attending, a resident, and medical students conduct a clinical pathological conference in the presence of the patient. The only acknowledgement made of the patient's presence is either a minor irritation that he is in the way of those who wish to look at x-rays, or that he is a "poor devil."

Whether the patient understands the phrase, "osteopenic sarcoma," or not, cannot be determined from his expression. Probably, since he is obviously an extraneous part of the conference, he has probably been paying as little attention to the conference as the physicians have been paying to him. The total effect is that of a callous group of doctors discussing an unfavorable prognosis in front of a patient.

Goal: Develop awareness that improper conduct (lack of consideration for the patient) by attending, during work rounds, can adversely affect the pa

After viewing this segment and participating in the discussion, the viewer will be able to:

1. develop empathy for the patient
2. become aware of the patient's presence and the effect of a physician's action or comments on him.
3. recognize the humanism required by the physician for realization that patient and problem are inseparable.

[illegible] [illegible]ership."

[illegible] underlying the "leadership" for this small group conference [illegible] the group member of the team. From the physician's opening [illegible] [illegible] anticipate too much from any of you" to his final [illegible] [illegible] that I'm disappointed," very little in terms of group [illegible]

[illegible], pharmacist, occupational therapist, and social worker's contri[illegible] the discussion are limited by over-bearing behavior and [illegible] [illegible] on them. Obviously, he may have listened but has failed to [illegible] comments, due to his single-minded attention for the [illegible] [illegible].

[illegible] that poor small group leadership technique conduct, [illegible] [illegible] group members.

[illegible] this segment and participating in the discussion, the viewer will [illegible]

1. become aware of the need for clearly defined agendas and objectives [illegible] group action to be effective.

2. realize the effect of improper group dynamics on participants.

3. recognize the importance of the leader's contribution to group [illegible] and well being.

4. realize that "group discussion" refers to a process rather than simply assigning a name to a meeting.

[illegible]: "Feedback!"

The illustration here is of non-functional or non-effective feedback. The [illegible] repeatedly tells the student, who is trying to make a clear [illegible] report of the patient he has just examined, what the student already knows: i.e., that his report is not very effective and not very well done. Throughout the exchange, the physician does nothing which will provide a clue to the student [illegible] he might alter his behavior so that it becomes acceptable to the instructor.

Goal: To illustrate the fact that non-specific feedback does not [illegible] [illegible] and exacerbates attempts to respond.

After viewing this segment and participating in the discussion, the viewer will [illegible]

1. [illegible] that non-specific feedback does not alter behavior [illegible] [illegible] respondent.

2. [illegible] sensitive to the need for effective feedback.

3. [illegible] personal behavior to avoid problems created by non-specific feedback.

[illegible] 5: "Question?"

[illegible] one-to-one encounter in which the attending does everything possible [illegible] teaching value. The resident initiates the situation by [illegible] [illegible] his rationale regarding a particular surgical approach. The [illegible] this opportunity to vigorously defend his action while [illegible] [illegible] in particular, and all residents in general. It is obvious [illegible] [illegible] and teaches the resident a very valuable lesson—don't [illegible] any questions about [illegible] procedures.

[illegible] of a number of ways of how not to teach using an individual [illegible].

[illegible] this segment and participating in the discussion, the student [illegible]:

1. Be aware of the effect of negative reaction to reduce effective future communication.

2. Have empathy for student when confronted with negative reaction to a request for information.

3. Develop sensitivity to differences between request for information and challenge to authority.

4. [illegible] in handling one-to-one situations.

[illegible] 6: "Trust!"

The physician-patient relationship is destroyed in this setting by an attending [illegible] arrives late on the scene. Initially, the patient is apprehensive about [illegible] procedure and asks many questions about the nature of the procedure [illegible] value. Resident answers these succinctly, calmly, and with [illegible] of clarity.

[illegible] about the fact the patient's fears are [illegible] contact with the resident, his direct comments to [illegible] that what the resident intends to do is [illegible] service. All of these actions combined, result in a [illegible] the part of the resident with the patient, and [illegible] and attending.

[illegible] of one method of improving patient-physician relationships, [illegible] resident effectiveness.

[illegible] this segment and participating in the discussion, the student will be able to:

1. [illegible] aware of residents need to be considered an effective physician by the patient
2. [illegible] impact of the attending/resident interaction in presence of the patient
3. [illegible] commitment to need for preserving patient confidence in [illegible]

[illegible] "[illegible]!"

An instructor hopelessly confuses four nursing students by using poor presentation techniques to teach an entire course in 5 minutes. It's obvious that he has not considered that he may have to provide some basic background data to enable them to understand what he wishes to teach. The students, who don't have any experience in the area of instruction, react as expected.

GOAL: Realize that poor quality instruction is perhaps worse than no instruction.

After viewing this segment and participating in the discussion, the viewer will be able to:

1. Be aware that good practitioners do not always make good teachers
2. Realize that students must have a common base of knowledge to which new information may be related.
3. Realize that poor presentation techniques inhibit learning.
4. Be aware that an attempt by an instructor to "cover a broad subject completely in 50 min. "sometimes reflects a lack of concern as to whether or not the student learns anything.

[illegible] Inquisition?"

[illegible] for authority by his [illegible] very effective [illegible] which have a very negative effect [illegible] being examined. The examiner first puts the student [illegible] by stating that he expects the student to do poorly, then [illegible] him the freedom to choose to answer the question in his own [illegible] student is finally reduced to a [illegible] quivering mass of [illegible] of the Spanish Inquisition.

[illegible] To realize that examinations often do not deal with [illegible]

After viewing this segment and participating in the discussion, the viewer [illegible] be able to:

1. Be aware that examinations can be superficial and impersonal.
2. Realize that certain comments by people in authority can cause confusion and tension on the part of listeners.
3. Be aware that a rigid adherence to pre-conception can make it impossible for another individual to express himself.

[illegible]

[illegible] are questions and teaching strategies that apply to each of [illegible]. They are intended only to be general guidelines to [illegible] the following discussion.

1. Discuss the segment. (The Instructional Guide can be used as an outline.)

   a. What was the doctor's intent?

   b. Did he succeed? Why or why not?

   c. What effect did the doctor have on the intent?

   d. What was the effect on the patient?

   e. What caused the difficulty?

   f. What could have been done differently?

2. Compare and contrast the film segment with what you think may have been more appropriate behavior.

3. Role play the situation, assigning parts to group members and asking them to play the part of an angry resident or tearful patient (or vice versa). Let non-participant group members critique.

   a. Videotape the role playing and play back letting participants and non-participant group members critique.

TITLE: Radiology, Interpretive Skill Development

PURPOSE:

A) Self-study materials for trainees to improve skill in the interpretation of radiographs

B) Materials to improve attending staff efficiency in teaching radiograph interpretation

TARGET POPULATION: Medical students and residents

BRIEF DESCRIPTION OF MATERIALS:

Organized teaching radiographs with provisions for immediate feedback to trainees, arranged by anatomic location and structured for independent use by trainees

UNIT ARRANGEMENTS:

Radiograph series illustrating various types of pathology in a given anatomic location with attached attenuated histories and obscured correct interpretations and bibliography viewed by the trainee after he has committed himself to an interpretation of the films.

OTHER: Overlays available for pre- and post-testing and coordinate description of fine or obscure detail

INTRODUCTION

This is to introduce a model for teaching the skills involved in interpreting x-ray films. The material is designed to permit the individual to develop or sharpen his interpretative skills on an individual, self-directed basis. It is hoped that by using this method, the attending staff time can be channeled to more efficient teaching tasks and allow the student to come to radiology interpretation session with a better established basic skill.

Principles

This technique involves students by exposing them to a series of roentgenographs or copies, rather than using texts or illustrations. The student takes a set of films from the file and is presented a brief, attenuated history (somewhat similar to what the radiologist ordinarily uses). He then observes the films and commits himself to an interpretation.

He then obtains immediate feedback by rotating the reprinted material in front of him 180 degrees. Written up-side-down on the same sheet in which the attenuated history has been given is the correct radiological interpretation of the films. This includes some brief discussion of the pertinent points illustrated by the films and is terminated by a list of appropriate references where necessary, (see example at the end of this paper), a transparent overlay for films can be prepared, setting up a grid system that allows the student to identify pertinent points in relationship to pre-determined coordinate system. This same type of overlay can also be used as a testing device, either before or after each exercise. The entire program can be accomplished without the use of instructor time, since the student interprets the films and gets immediate feedback by which he can correct his errors or develop more acute interpretive skills. By obtaining immediate feedback the student can correct errors and develop skill with repeated practice or review.

The roentgenographs should be arranged anatomically from those which show only normal structures to those with very obvious pathology, and can include those which have very fine or difficult radiological points in their content. By presenting this group of films, arranged only by anatomical area and not by pathology, excess cueing of the student is avoided.

It should also be noted that this form of presentation permits the learner to develop skills with direct transference to patient care. This marks the program as different from those presented in radiology texts. The skill of locating and identifying abnormalities and determining if such abnormalities are significant, is analogous to patient care delivery. Locating a structure, identified in written material as being pathologic, is not.

Suggestions

This method of teaching x-ray interpretive skills can be used with several different purposes in mind. Conceivably, a comprehensive file of materials could be developed that would cover almost all systems in all areas and all types of pathology. This system could be used to develop basic skills, which, in turn, can be used in the course of subsequent roentgenographic interpretation conferences, where more detailed instruction and criticism and feedback can be provided by skilled radiologists. Another might be the development of a series of cases which are relatively infrequent in a particular training institution, to increase the interpretive skills that are necessary but that may be difficult to develop with a limited amount of case material.

Regardless of the purpose to which such material is to be put, several basic principles need to be kept in mind when setting up an interpretive skill program:

A. Material used should be the actual roentgenograms or copies of the roentgenographs; 3 x 5 or 35mm slide material is not acceptable since it does not approach reality as does the actual roentgenogram or its full-sized copy.

B. The material should be organized along anatomic areas rather than along disease or pathologic areas, since the focus is on developing interpretive skills which cross pathologic boundaries.

C. The history actually given to the trainee should be minimum to avoid excessive cueing. It should be remembered that a specific diagnosis is not necessarily required. The interpretation of the pathological process or processes illustrated by the roentgenograph at hand should be the focal point. At times this may lead to a logical differential diagnosis rather than a specific diagnosis.

D. Adequate immediate feedback must be provided. This may necessitate grid overlays as previously mentioned in order to accurately point out fine points of the roentgenographic interpretation.

E. Adequate, up-to-date references must be constantly available in the feedback and the feedback material must be kept short.

F. Some method which requires the trainee to commit himself on his interpretation prior to actual review of the feedback material should be provided. Only in this way can the trainee adequately analyze and improve his skills.

G. The material must be available at the student's convenience. It is the purpose of this material to serve as a self-teaching aid. Such availability can aid in diminishing the attending or technical staff time while increasing the efficiency of the time used by such highly trained staff in the course of further educating the trainee.

Illustrations

The following group of roentgenographs of the childrens' elbows are illustrative findings secondary to trauma (this information would not have to be given to the student). One of the roentgenograms exhibits obvious pathology; one exhibits no significant pathology; and the other two illustrate fine points in interpretation which are important in the evaluation of x-rays of children who have had elbow trauma.

BH/mp
March, '72

Discussion --

This patient presents with rather diffuse pain and tenderness and it is difficult to accurately determine the site of injury. The larger of the two films exhibits two views of the forearm and shows no definite pathology. The smaller film on the lateral view of the elbow exhibits only some increase soft tissue density in the region of the joint compatible with an effusion. But on the AP view on the medial side the fracture line is visible compatible with a transcondylar fracture.

The set of films illustrates the necessity of obtaining an adequate radiological study, particularly when history and physical findings do not definitely indicate the location of the pathology. If only a set of films of the forearm had been taken, the fracture would have been missed, but in an individual with an injured extremity, the principle that the x-ray study should include adequate views of the joint below and above the apparent site of injury holds true. In the elbow region particularly and especially with children, two sets of films may be necessary to obtain an adequate study. An AP and lateral view of the forearm to include the elbow and an AP and lateral view of the humerus to include the elbow. When the x-ray technician takes these films the projections are slightly different and frequently occult or elbow pathology can be visualized on one set of films when it is not able to be seen on the other set.

A fracture of this type requires very little in the way of treatment other than splint protection to avoid further injury. Healing occurs quite rapidly without evidence of complication or limited motion, although one must remember that the elbow is one of the few joints which may remain somewhat stiff after trauma even in children. Again as in any injury involving the elbow region of a child, attention must be paid to the possibility of complications developing. The likelihood in a fracture of this type is quite remote, but parents should be warned if the child is being treated as an outpatient or in the office that the child should be relatively comfortable after immobilization. In the absence of additional trauma persistent pain requires immediate re-evaluation by the physician.

(Con'd)

Case - C. S.

History --

The seven-year old girl presents with a history of falling while running in a school yard subsequent to which she complained of pain in the left elbow.

5.1

Bibliography -- Case - C. S.
Page Two

Blount, W.: Fractures in Children, Baltimore, 1954, the Williams and Wilkin Co.

Henrickson, B.: Supracondylar Fracture of the Humerus in Children, Acta-Chir. Scand. (Supp. 369), 1966, pps. 1-82.

Lipscomb, P. R., and Burleson, R. J.: Vascular and Neuro Complications and Supracondylar Fractures of the Humerus in Children, J. Bone Joint Surgery, 37-A:487-492, June, 1955.

Rogers, S. L., et al; Radiology of Changes Due to Trauma in the Fat Plain Overlying the Supinator Muscle, A Radiologic Sign, Radiology 92:954-958, April, 1969.

Discussion --

This patient has a comminuted supracondylar and intracondylar fracture of the distal right humerus. No true dislocation is present although in the lateral view some question may be raised because of the over-lapping shadows. On the AP view it is noticed that the fracture line extends all the way from medial to lateral and also down into the intracondylar notch between the capitellum and the trochlea. The comminution of the distal humerus is noted as well as some impaction on the lateral side, and when the lateral view is viewed, distal fragment is angulated posterior relative to the proximal fragment.

Of primary importance in the initial evaluation of the patient with x-ray findings of this type, is determining whether or not there is neuro-vascular injury. Pallor and pulselessness of the hand are tip-offs to the possibility of this type of injury, particularly after attempts of reduction have been accomplished. Persistent pain after reduction and immobilization, regardless of method used, is also an indication that there may be a complication of the primary injury. Children with this injury must be watched closely for the development of this complication, and many authorities feel that an injury of this type requires hospitalization for observation regardless of the method of treatment. Persistent pain or paralysis, particularly of the extensors of the wrist and fingers, indicates the need for urgent thorough evaluation and the possibility of further treatment to avoid neuro-vascular disaster.

In reducing fractures of this type one must attempt to restore anatomy to as close as possible to normal since failure to do so can result in relative cubitus valgus or cubitus varus-- a deformity not acceptable to most patients. The treatment of these fractures is still a matter of some discussion; manipulation, traction, a combination of the two are used in most centers. The keys to the treatment are the restoration of anatomy to as close to normal as possible, with careful observation particularly soon after injury to avoid any complications. Total treatment time will range from four to eight weeks, depending on the age of the patient, with a brief period to regain full function thereafter. (Cont'd)

Case - K.B.

History:

This young boy presents with a history of having fallen from a swing and landing on his outstretched right arm, as near as his parents can determine. He complained immediately of pain in the region of his right elbow.

Henrickson, B.: Supracondylar Fracture of the Humerus in Children, Acta-Chir. Scand. (Supp. 369), 1966, pps. 1-82.

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Fahey, J. J.: Fractures of the Elbow in Children, Amer. Academy of Ortho. Surg., Instructional Course Lectures, Vol. XVII, St. Louis, 1960, C. B. Mosby Co., p. 13.

Graham, H. A.: Supracondylar Fractures of the Elbow in Children, Clin. Ortho., 54;85-102, 1967.

Discussion -- Case - R. A., Jr.

This set of films was considered basic in terms of the evaluation of an elbow problem. It includes an AP view, a lateral view and two oblique views. Little obvious osseous pathology is present, but if the patient does exhibit a so-called fat-pad sign, then on the lateral view of the elbow a light area indicating the fat pad of the elbow is displaced slightly volarward from the anterior aspect of the distal humerus. This is compatible with an effusion in the joint, indicates the need for protection of the extremity and further evaluation at a later date. It may be the only finding of an occult fracture observed on the initial set of films. In this particular case no fracture was present but the degree of effusion did cause pain for a moderate length of time. While the joint is painful and its motion limited, this extremity must be protected to avoid further injury. Re-x-rays are an absolute necessity within a week to ten days during which the extremity should be protected.

Bibliography --

Rogers, S. L., et al: Radiology of Changes Due to Trauma in the Fat Plain Overlying the Supinator Muscle, A Radiologic Sign, Radiology 92:954-958, April, 1969.

Henrickson, B.: Supracondylar Fracture of the Humerus in Children, Acta-Chir. Scand. (Supp. 369), 1966, pps. 1-82.

Blount, W.: Fractures in Children, Baltimore, 1943, the Williams and Wilkin Co.

Case - R. A., Jr.

History --

This young man presents in the office having fallen while ice skating. He complains of pain in the left elbow region.

Case - J.M.McH

Discussion -- 95

This is a complete study of the involved elbow in this patient and includes an AP and a lateral view as well as both obliques. These films are entirely within normal limits in terms of the osseous structures, but the soft tissue structures about the elbow are not too well visualized and may indicate edema in the area. No true fat pad sign is noted and there is no evidence of significant fracture or other soft tissue injury. One must be very cautious in interpreting these films so that a normal growth center is not interpreted as a fracture. Note on the lateral view the olecranon apophysis is a normal structure but a separate ossification center. The anteroposterior view shows the medial epicondyle is, in fact, in good position. When looking at oblique views, question may be raised regarding whether or not it has been displaced. On the medial lateral oblique view the olecranon apophysis is thrown into superimposed projection in the region of the trochlea and might be misinterpreted as a fracture in the area. To accurately determine the normal status of a child's elbow, reference must be made to the usual radiological growth charts which list the time of appearance and time of fusion of the epiphyseal centers about the elbow.

Bibliography --

Rogers, S. L., et al: Radiology of Changes Due to Trauma in the Fat Plain Overlying the Supinator Muscle, A Radiologic Sign, Radiology 92:954-958, April, 1969.

Henrickson, B.: Supracondylar Fracture of the Humerus in Children, Acta-Chir. Scand. (Supp. 369), 1966, pps. 1-82.

Blount, W.: Fractures in Children, Baltimore, 1943, The Williams and Wilkin Co.

Case - J.M.M-H

History --

This 12-year old young man was wrestling and had his arm twisted, subsequent to which he experienced pain in the right elbow.

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